



The Gambia livestock sector analysis



Government of The Gambia

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Abbreviations and acronyms

ADP	Agricultural Domestic Product
AGDP	Agricultural gross domestic product
AGR	Animal genetic resources
AI	Artificial insemination
ASFs	Animal source foods
AU-IBAR	African Union-Inter African Bureau for Animal Resources
BAU	Business as usual
CEDAW	Convention on the Elimination of all forms of Discrimination Against Women
CRR/N	Central River Region North
CRR/S	Central River Region South
DDM	Digestible dry matter
DLS	Department of Livestock Services
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GLMP	The Gambia Livestock Master Plan
HESM	Herd and economic sector model
IHS	Integrated Household Survey
ILRI	International Livestock Research Institute
IsDB	Islamic Development Bank
LG	Grassland or grazing land system
LL	Landless livestock production system
LMP	Livestock Master Plan
LRR	Lower River Region
LSA	Livestock Strategy Analysis
LSIPT	Livestock Sector Investment and Policy Toolkit
LSS	Livestock Sector Strategy
MI	Mixed irrigated systems
MR	Mixed rainfed systems
NARI	National Agricultural Research Institute

NBR	North Bank Region
NCD	Newcastle Disease
NDP	National Development Plan
OIE	World Organisation for Animal Health
PPP	Public –private partnership
ROIs	Returns on investment
SPCR	Strategic Program on Climate Resilience
SRPEP	Small Ruminant Production Enhancement Project
URR	Upper River Region
VCs	Value chains
WALIC	West Africa Livestock Innovation Centre
WCR	West Coast Region

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1 Introduction

An important component of the Gambia Small Ruminant Production Enhancement Project (SRPEP¹) is the development of a Livestock Master Plan (LMP) for the Gambia that is aimed at transforming the sector to improve livelihoods, employment (particularly for youth) and national income.

The Gambia LMP is meant to guide the ongoing project to enhance the provision of additional public and private investments in the livestock sector and improve livestock contributions to achieving the stated development goals, explained in the National Development Plan (NDP). An essential element of the SRPEP project is developing LMP to transform the sector to improve livelihoods, employment (particularly for youth) and national income.

The purpose of producing an investment roadmap or LMP is to attract more substantial and better targeted livestock sector investments from finance ministries, development partners (DPs) and private sector investors. The development of the Livestock Strategy Analysis (LSA) is an important component of the LMP process.

To help raise public and private investment and allocate more budget to the livestock sector, the Government of the Gambia, through the Islamic Development Bank (IsDB), requested the International Livestock Research Institute (ILRI) to provide technical assistance in developing a comprehensive LMP.

The Gambia LMP will address the following issues:

- Provide evidence on priority areas for which it is essential to secure necessary investments and detailed information. The LMP will guide long-term planning in the livestock sector in the Gambia.
- Assess the key livestock value chains for their potential and challenges for an effective contribution to the Gambian economy. Areas of focus of the study will include modernizing the dairy sector, developing poultry and small ruminants avenues and animal product processing. This will entail the use of more productive indigenous breeds (the output of selection, control breeding and Artificial Insemination) and exotic and crossbred animals. Improvements will also be made in the control of disease, animal husbandry, veterinary healthcare delivery, animal product processing and marketing.

The Gambia in West Africa occupies a land area of 10,120 km² and an approximately 1,300 km² water bodies and a total area of 11,300 km². A small subtropical country between latitudes 13°28 N and 16°36 W, bordered to the north, south and east by Senegal and has an 80 km coast on the Atlantic Ocean to the west. The country's borders roughly correspond with the path of River Gambia.

The country's human population stands at 1,857,181 persons (The Gambia Bureau of Statistics; Population and Housing Census Report 2013) and represents an increase of 26.7% compared to figures derived from the Population and Housing Census in 2003.

1. The Gambia Small Ruminant Production Enhancement Project (SRPEP) supported by the Islamic Development Bank (IsDB), aims to improve the livelihoods of over 30,000 livestock producing households by improving productivity of local breeds through better feeding and husbandry practices, fostering greater access to veterinary services and production infrastructure such as boreholes, increasing the availability of mutton at good prices and enhancing market capacity from both technical and institutional standpoints across different livestock value chains.

The Gambia is within three agro-ecological zones: Sahelian, Sudano-Sahelian and Sudano-Guinean. The country has a subtropical climate with two variations of distinct dry and rainy seasons. The dry season usually starts in mid-October and ends around mid-June every year with an average temperature of 32°C/89.6°F. The rainy season (rainfall averaging 1,020 mm and ranging from 800 mm in the east to 1,700 mm at the western end of the country) usually starts around mid-June and ends around mid-October; with August being the wettest month of the year, temperatures can reach up to 41°C/105.8°F.

The country has an 80-km Atlantic coastline with an exclusive fishing zone of 200 nautical miles within the continental shelf. The agricultural land is 6,550 km² and the arable land is 588 thousand hectares, out of which 334 thousand hectares are under cultivation. It has a forest area of 4,750 km² (i.e. 47.5% of the land area).

Agricultural production is predominantly rainfed. It is characterized by variability and largely unpredictable weather and rainfall patterns that seldom exceed five months annually. Cash crops produced include rice, maize, millets, sorghum, groundnuts and vegetables. Livestock production and fisheries also contribute significantly to the livelihood of the population.

In the Gambia, the agricultural sector is one of the leading contributors to GDP, accounting for 20–30% of the national GDP. The livestock subsector contributes 20 and 8% to the agricultural and national GDP, respectively. The agricultural sector is a key driver of socio-economic development, providing food, income and employment (for 75% of the country's working population). The Gambia's GDP growth rate declined from 7% in 2018 to 6.2% in 2019 to –0.2% in 2020 (Trading Economics Central Bank of the Gambia 2020), primarily due to the slump in tourist arrivals as a result of the outbreak of COVID 19.

1.1 The context for the Gambia LMP in the current national strategies and planning

The Government of the Gambia currently is implementing a National Development Plan (NDP), 2018–2021. The goal of the NDP is to deliver good governance and accountability, social cohesion, national reconciliation and a revitalized and transformed economy for the well-being of all Gambians (Government of the Gambia 2018). The NDP is anchored on eight strategic priorities or development objectives, namely:

- Restoring good governance, respect for human rights, the rule of law and empowering citizens through decentralization and local governance;
- Stabilizing the economy, stimulating growth and transforming the economy;
- Modernizing agriculture and fisheries for sustained economic growth, food and nutritional security and poverty reduction;
- Investing in people through improved education and health services and building a caring society;
- Building infrastructure and restoring energy services to power our economy;
- Promoting inclusive and culture-centred tourism for sustainable growth;
- Reaping the demographic dividend through an empowered youth; and
- Making the private sector the engine of growth, transformation and job creation.

Agriculture under the NDP aims to have a modern, sustainable and market-oriented agriculture and livestock for increased food and nutrition security, income and employment generation, poverty reduction and economic transformation. Modernizing agriculture will involve transitioning from low-input, subsistent production systems to more mechanized, market-oriented agriculture through:

- Utilization of improved breeds and the application of better management practices
- Enhancement of the productivity of the indigenous breeds and cautious usage of the improved exotic breeds and crossbreeds
- Better access to veterinary services
- Improvement in the value chains of species (particularly in value addition and the marketing of livestock and livestock production).

The NDP recognizes the livestock subsector as a prime asset and renewable resource that creates opportunities to reduce poverty, food insecurity, malnutrition and to create employment and income-generating activities (particularly in rural households).

The plan set the following targets for the livestock subsector:

- Increase cattle production by 56% (offtake from 11.9 to 15.9%)
- Increase sheep production by 5% (offtake from 22.3 to 29.8%)
- Increase goat production by 11% (offtake from 25.1 to 33.5%)
- Increase milk production by 10% from 25.8 million litres to 28.4 million litres. (Most milk produced in the Gambia is from cattle, given that milk production from small ruminants is insignificant).
- Examine the status of the meat processing industry, assess the economic and financial viability of the initiative and propose feasible strategies, activities, appropriate technologies, as well as best management practices along with an implementation and procurement plan for the meat plant. In particular, the assessment of existing conditions to support the establishment of a state-of-the-art halal slaughterhouse in the Gambia for both domestic and export markets is a priority considering the possible construction of a modern halal meat processing plant through financing by the Islamic Development Bank (IsDB).

To meet these targets, the NDP identified priority value chains in the livestock subsector to strengthen the value chain actors, promote agribusiness, processing and enhance a viable marketing system.

The strategy for strengthening the subsector is to develop a market concept (geared towards satisfying the needs of the clients and enhancing the sustainable use of cattle, sheep, goats, chicken and livestock products. The concept represents a major change in the current orientation that provides the foundation for the achievement of competitive advantage). The strategy is anchored on the following:

- Support livestock traders, associations and women's groups that are involved in fattening and sale of livestock and processing animal products
- Construct livestock infrastructure such as slaughterhouses/slabs and butcher's shops that meet food safety standards
- Establish a market information system
- Organize livestock shows/fairs
- Establish mechanisms for facilitating access to credit.

The NDP reiterates the government's policy direction of reversing the erosion of livestock genetic resources by adopting a comprehensive approach to promote the sustainable use, development and conservation of animal genetic resources to increase food production and food security, reduce poverty and contribute to rural development. Implementing the national strategy and action plan for managing animal genetic resources is geared towards achieving the above objective.

Apart from disease incidence, the threat to erosion of animal genetic resources diversity in the Gambia is compounded by encroachment on traditional livestock grazing and watering areas (human settlements, double cropping of rice, cashew plantations etc.) and the destruction of the habitat of vectors of diseases allowing gene pool dilution of indigenous breeds as they are gradually replaced by more productive but less disease-tolerant imported breeds/crosses.

To guard against the mentioned threat, the international community (109 countries) in 2007 adopted the Global Plan of Action for Animal Genetic Resources (and The Interlaken Declaration on Animal Genetic Resources), confirming their commitment to the conservation and sustainable use of animal genetic resources for food and agriculture. Translating the Global Plan of Action into a national action plan required the preparation of the National Strategy and Action Plan, which spearheaded the move towards more effective and sustainable use, conservation and development of animal genetic resources (Loum 2019).

1.2 The added value of the livestock master plan

There is often considerable under-investment in livestock development despite the growing importance of livestock in rural economies and animal source foods in urban diets (Delgado et al. 1999; Herrero et al. 2015). This under-investment is a major constraint to modernizing the livestock sector and can prevent it from making an even more substantial contribution to national and/or state development goals; including poverty reduction, food security, economic growth and even mitigating climate change (Herrero et al. 2015; Shapiro et al. 2015). In the Gambia, this is evidenced in the government budget appropriation to ministries, in which the livestock subsector received 7.45 and 7.24% of the 2020 and 2021 agricultural budget, respectively. The Ministry of Agriculture has received an appropriation of 1.82% of the total annual budget for 2021 (Government of the Gambia 2021), implying that the livestock subsector received a meagre 0.13% of the total annual budget in 2021 (yet livestock contributed approximately 3–5% of the GDP in the same year). Such a low budget allocation for the livestock subsector is common in low-income countries, stemming from the lack of convincing quantitative evidence of potential impacts to get sufficient financial resources from finance ministries (Shapiro et al. 2015). Thus, returns on investment (ROIs) based on *ex-ante* impact assessments of combined technologies and policies are needed to help the livestock ministries attract more substantial investments from finance ministries and private sector investors.

Another hindrance to generating convincing evidence to motivate public planners and private investors to increase their livestock investments is a lack of capacity to build and use quantitative sector models that document the ROIs possible from new livestock technologies and policies for sector transformation. Such modelling skills are not common in most livestock agencies in developing countries.

Using available data from secondary sources and national livestock experts, the International Livestock Research Institute (ILRI) Livestock Master Plan (LMP) team has developed a livestock herd and economic sector model (HESM) for the Gambia and then has carried out the baseline assessment (for the base year of 2020/21) of the 15-year livestock sector analysis (LSA), under the current level of investment. The LSA will inform the livestock sector strategy (the 15-year with additional investment analysis) and the 5-year investment analysis, which will result in the development of the Gambia Livestock Master Plan (GLMP), investment implementation plans or 'roadmaps'.

The LSA is conducted for the business as usual (BAU) scenario or no additional investment, from 2020/21 to 2035/36. It sets a baseline for the long-term foresight analysis, providing quantitative and evidence-based justification for public and private investments in the Gambia livestock sector's recommended and prioritized commodity value chains (VCs).

In carrying out the LSA, to choose the investment and policy interventions to be analysed in the 15-year livestock sector strategy and recommended in the 5-year roadmaps or sector investment plan for the Gambia, the alternative investments in new technologies or innovations combined with policy changes will be tested to compare their impacts or contributions to the following specific development objectives (through measurable indicators) chosen by the Gambia livestock sector experts.

The identified development objectives are:

- Poverty reduction (improvement in household incomes)
- Economic growth (contribution of the livestock sector to Agricultural Domestic Product (ADP))
- Improvements in food and nutritional security of rural people, especially women and children (more animal source foods—ASFs, including more protein and carbohydrate)
- Contribution to social equity (household and post-production income, women empowerment, employment and investment increases for women, youth and scheduled minority groups).

The baseline analysis was conducted using quantitative tools from the Livestock Sector Investment and Policy Toolkit (LSIPT)². Gender analysis included a literature review drawing on published and grey literature, government surveys, stakeholder meetings and virtual key informant interviews.

Once the model or livestock herd and economic sector model (HESM) was developed, it was used to evaluate the productivity over the 15 years based on the sector's present technical and economic performance, given current, no additional investments in technologies and policies. Meanwhile, specific farm systems with potential impact on gender have been identified and included in the analysis. This will help interpret the potential and differential impacts of proposed technology–policy interventions on men and women.

This LSA is organized as follows. Section 2 provides an overview of the livestock systems in the Gambia, defines the livestock systems and production zones and elucidates important technical parameter. Section 3 describes the existing opportunities and constraints within each priority livestock value chain. Section 4 describes the policy and institutional constraints and opportunities. Section 5 combines the baseline analysis results and explains the current and future contributions of the livestock sector, given the current level of investments. Finally, Section 6 provides some concluding remarks from the baseline analysis.

2. Detailed description of LSIPT is given on annexe IV.

2 Livestock systems in the Gambia

2.1 Livestock systems classification in the Gambia

The climate variability that affects traditional livestock production (or agricultural production in general) is not discernible due to the small size of the Gambia. However, notwithstanding, the country has two distinct regional climate classifications:

Tropical savannah—covers the country's western half, including the coastal regions (Banjul, West Coast, North Bank and Lower River Regions). The average annual temperature is 25.6°C with a unimodal annual average rainfall of 619 to 719 mm. The rainy season is from July to October. Generally, humidity is low during the dry season (November–June) (47 to 56%) and high during the rainy season (80 to 84%).

Hot semi-arid (Sahelian type of climate)—covers the eastern half of the country (Central River Region/North, Central River Region/South and Upper River Region). The average annual temperature is 28.9°C, with a unimodal annual average rainfall of 675 mm. humidity ranges from 33 to 83% during the year.

The country has a subtropical climate with temperatures ranging from 29 to 34°C with a rainy season (July–September) and a dry season (October–June). The country's eastern half is slightly warmer and drier than the western part in climatic variability.

The country is relatively flat, with 75% of its landmass below 20 metres above sea level (MASL). The highest elevations (53–60 MASL) are in the Lower River, Central River and Upper River Regions.

Agriculture remains a key sector in the Gambian economy, serving as a driver for socio-economic development, providing food, income and employment (for 75% of the country's working population).

There can be as many livestock production system classifications as possible combinations of criteria used (Seré and Steinfeld 1996). In this study, the Gambia livestock production systems are classified based on the Seré and Steinfeld (1996) approach, which uses a combination of criteria and the farming system concept. It classifies livestock systems into four types: 1) landless livestock production system (LL, which may be monogastric or ruminant), 2) grassland or grazing land system (LG, in which crop based agriculture is minimal), 3) mixed rainfed systems (MR, mostly rainfed cropping combined with livestock keeping) and 4) mixed irrigated systems (MI, in which a significant proportion of cropping uses irrigation and is interspersed with livestock). A farming system is defined as a group of farms with a similar structure, such that individual farms are likely to share similar production functions (Dixon et al. 2001). Classifying similar livestock production systems into production zones based on agro-ecological criteria and farming systems characteristics provides the opportunity to group production systems with similar challenges and opportunities. It can thus simplify the planning of development options/interventions.

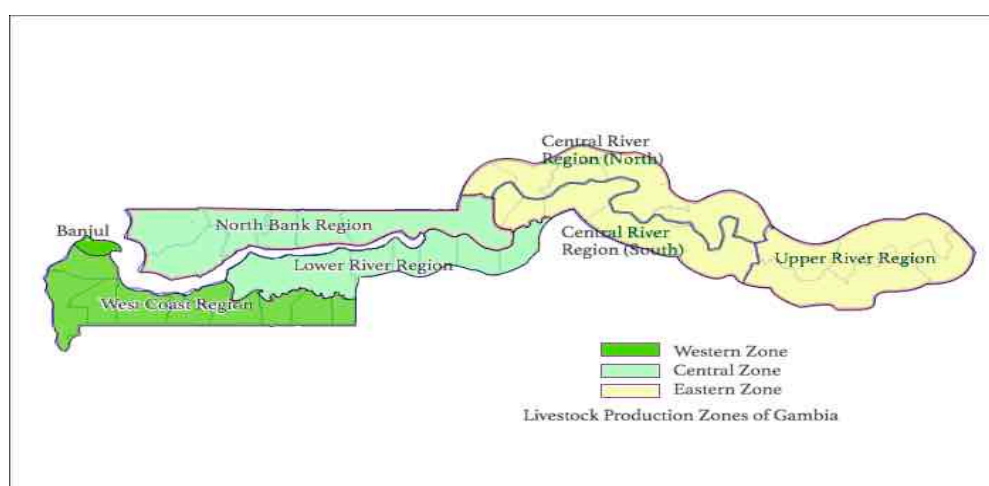
In the Gambia, agricultural regions comprise the following:

1. NBR—North Bank Region
2. CRR/North—Central River Region North
3. CRR/South—Central River Region South
4. URR—Upper River Region

For the Gambia LMP, following Seré and Steinfeld (1996) and recommendations from a team of livestock experts, the country is divided into three regions (Figure 1), namely:

- The Western Region comprising KMC³ and West Coast Region (WCR)
- The Central Region comprising NBR and LRR
- The Eastern Region includes CRR/N, CRR/S and URR.

Figure 1. Livestock production zones of the Gambia.



The process for the development of the LMPs requires the participation of national experts in the determination/confirmation of production and financial parameter of the species of livestock that will be studied (Table 1). In the case of the Gambia, the concentration will be on the following species:

1. Cattle (including dairy cattle)—the overwhelming majority of cattle in the country are of the dual purpose N'Dama breed (97.7%) (The Gambia National Livestock Census 2016)
2. Sheep
3. Goats
4. Poultry (including backyard, commercial broiler and layer production).

The majority of livestock production occurs in the predominantly traditional and small-scale and is generally not commercially oriented. It is characterized by poor management, low productivity, low offtake rates and high disease incidence resulting in high mortality rates for all the livestock species produced.

In the Gambia, cattle production forms an important and integral component of the agropastoral/mixed farming system, providing manure, milk, meat and a reserve source of income for satisfying sociocultural and other obligations. The production systems practised are as follows:

3. KMC—Kanifing Municipal Council is an urban/peri-urban area with minimal potential for agricultural production, although urban agriculture is gradually becoming important.

Extensive system—This is the predominant system based on livestock production and crops (mixed farming). It is characterized by the usage of indigenous breeds of low productivity (N'Dama and Gobra/zebu), with little to no improvement programs. Transhumance and internal migration are practised in search of pastures and water during the dry season.

Semi-intensive system—Selected animals (including draught animals) are given supplementary feeding using agro-industrial by-products and crop residues to increase meat, milk, manure and draught power.

Intensive system—This system is practised mainly in the urban and peri-urban areas using pure breeds (mostly European breeds) and crosses of N'Dama and European breeds to increase productivity (both milk and meat). Artificial insemination (AI) is practised for improving performance.

Cattle are reared in all the administrative regions, but production is concentrated in the rural areas. Cattle herds (average herd size is 56 animals) are managed by herdsmen responsible for their overall supervision. The animals are tethered overnight to pegs and are herded in the morning for grazing in communal rangelands (mainly marginal and fallow lands) for 6–8 hours daily. This extensive management system is applied to the majority of the cattle population (87.9%), while the semi-intensive system is mostly practised for draught animals (12%) (National Livestock Census 2016). Communal rangelands are the main source of feed for the cattle herds. During the dry season, however, they have access to crop residues once field crops are harvested.

Lactating cows are milked once or twice daily and the produced milk is sold unprocessed, either as raw or fermented milk. Animals are not individually tagged and reproduction and production performance records are not maintained.

Table 1. Livestock production zones and priority species of the Gambia

Species	Livestock production zones			SP (Specialized)— Urban and peri-urban
	Western	Central	Eastern	
Cattle (Accor. major breeds)	N'Dama	N'Dama	N'Dama	Small: 1–10
	Zebu/Gobra	Zebu/Gobra	Zebu/Gobra	
Sheep (Acc. major breeds and ownership)	Djallonke	Djallonke	Djallonke	
	Sahelian	Sahelian	Sahelian	
	Female owned (Djallonke)	Female owned (Djallonke)	Female owned (Djallonke)	
Goat (Acc. major breeds and ownership)	West African Dwarf	West African Dwarf	West African Dwarf	
	Female owned (West African Dwarf)	Female owned (West African Dwarf)	Female owned (West African Dwarf)	
Chicken	Traditional backyard chicken Layer			Broiler

Source: Author.

N'Dama cattle are the dominant cattle species in the country (Table 2). Their crosses are used in the smallholder commercial dairy production in the peri-urban areas under semi-intensive to intensive management. Various forms of housing, zero-grazing, grazing with supplementation and inputs for disease control are provided. Individual animals are tagged and some production records are maintained.

Table 2. Cattle distribution pattern by breed and region for 2016

Regions	Cattle Breeds (Non draught)			Draught cattle		Total All cattle
	N'Dama	Zebu/Gobra	Other	N'Dama	Zebu/Gobra	
Number of animals						
Western	33,116	447	190	3,778	117	37,648
Central	75,805	1,767	9	12,440	833	90,854
Eastern	144,624	1,542	128	16,457	1,584	164,335
Total	253,545	3,756	327	32,675	2,534	292,837
Total %	86.6	1.3	0.1	11.1	0.9	100

Source: National Livestock Census (2016).

In the 1980s, it was generally accepted, by many livestock specialists in the Gambia, that the country was nearing the threshold of the carrying capacity for the national cattle herd. Hence the population has stabilized at around 300 thousand heads (Sumberg 1988 and others).

Small ruminants and poultry play a vital role in the livelihood of the rural populations in the Gambia. Their population, particularly goats and chicken is widespread in all regions and has steadily increased over the last two decades (Table 3). They are raised to generate income and meet the nutritional requirements of rural families. They are also sold to meet other family needs and to fulfil the socio-cultural obligations of the owners. These short cycle livestock species are easier to sell and thus serve as ready sources of income for the purchase of food during lean periods. The erratic nature of rainfall and crop failures observed in recent years imply farmers rely more on small ruminants and poultry to meet the food and other requirements of the families.

Table 3. The Gambia livestock populations by species, selected years 1991 to 2016

Species	1991 ¹	1993/94 ²	2002 ³	2014 ⁴	2016 ⁵
Cattle	340,000	279,000	323,000	479,083	292,837
Sheep	167,000	116,000	129,000	53,189	172,662
Goats	191,000	214,000	228,000	359,835	328,336
Oxen	NA	17,000	17,000	NA	32,209
Horses	17,000	18,000	18,000	4,593	22,070
Donkeys	43,000	33,000	33,000	22,941	65,650
Pigs	NA	NA	8,000	8,192	14,830
Chicken	550,000	NA	858,000	609,180	937,951

Sources: 1. Livestock Sector Review 1991; 2. National Livestock Census 1993/94; 3. NASS 2003; 4. NASS 2014; NASS 2016.

The small ruminant production system is extensive and subsistent. Different management practices are used for rainy and dry seasons. During the rainy season, flocks are housed during the night and during the day, all the sheep and goats in the villages are pooled to form big flocks and kept away from the crop fields. In some regions, the small ruminants are tethered near the villages or in uncultivated crop fields. However, in the dry season, the animals are left to roam around the villages scavenging on domestic waste or grazing on crop residues in the harvested fields.

Productivity of small ruminants under the traditional system is relatively low due to the low productivity of the indigenous breeds (with lambing and kidding rates of 1.2 and 1.5%, respectively and carcass weight of 14 kgs for both species), inadequate nutrition, poor management practices and high mortality rates due to frequent disease outbreaks. Unlike cattle, sheep and goats are sold annually, as evidenced by the higher offtake rate.

Traditional poultry production is extensive. The birds are kept in small flocks in the backyards of the owners. In most cases, the birds are owned and managed by women and children. They are confined during the night in locally made shelters to minimize predation, while birds are left to scavenge in the backyards during the daytime. Supplementary feeds such as millet and brans, as well as water, are provided for the birds. The traditional poultry flocks consist of local breeds that are poor producers of meat and eggs compared to exotic breeds. The birds are easier to sell or slaughter for home consumption and for that reason, they serve as a ready source of income and protein for the rural population.

Transhumance is an important attribute of the livestock production system in the Gambia and it serves as a coping strategy to guard against feed and water scarcity during the dry season. It is also undertaken to move livestock away from areas designated for crop production during the rainy season. During the dry season, cattle herds migrate from the Eastern Region to the flood plains of the Central Region. In the Central Region, the movement of cattle herds is mainly from CRR/S to the Casamance Region of southern Senegal. During the same period, there is an extensive movement of small ruminant flocks and cattle herds from northern Senegal to CRR/N.

The Central River Region is the preferred destination for migrant cattle herds due to the availability of feed and water in the flood plains, islands and rice fields during the dry season.

Migration is also prevalent in the North Bank Region of the Gambia. The herds move within and between the districts in search of pastures and water. During the dry season, swampy areas and districts with lowlands and rice fields are the targeted destinations. Herds are also forced to move for short distances to avoid damage to the crop fields during the rainy season.

2.2 Livestock species distribution over the different production zones

Table 4 and Figure 2 show the livestock number and proportion over the different livestock production zones. The Eastern production zone keeps about 56% of the cattle, 52% of the goats and 64% of the sheep of the Gambia. On the other hand, the Western production zone has the lowest cattle, goats and sheep.

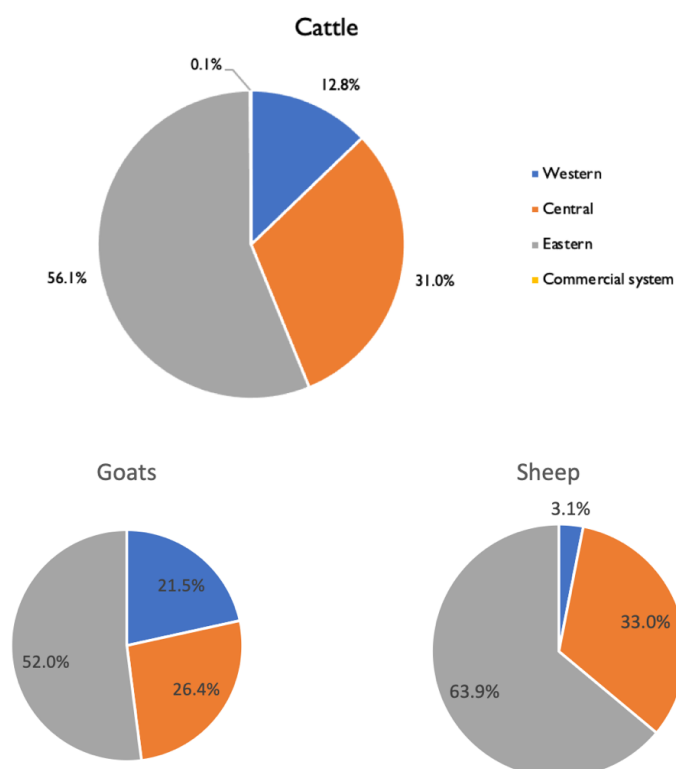
Table 4. Base year (2020/21) livestock number and distribution over the three livestock production zones and commercial system

Production zone	Cattle	Sheep	Goats	Chicken
Western	38,046	5,812	77,653	
Central	91,815	62,091	95,230	1,002,185
Eastern	166,073	120,352	187,474	
Commercial system	330			221,434
Total	296,265	188,256	360,357	1,223,619

Source: Estimated based on data from 2016.

As discussed in Section 2.1, the Eastern livestock production zone has a larger land mass than the Central and Western production zones. Thus, it is pertinent to consider that higher population, production or GDP contributions for the Eastern livestock production zone compared to the other two production zones may not demonstrate the superiority of the zone. The Eastern livestock production zone is the dwelling for more than half of the cattle and goats population and about two-third of the sheep population in the Gambia (Figure 2).

Figure 2. Base year (2020/21) livestock distribution over the three livestock production zones and commercial system.



2.3 Livestock output distribution over the main production zones

The Eastern production zone contributes significantly (nearly 60%) to the red meat⁴ production in the Gambia (Table 5). The contribution of the commercial system, mainly commercial dairy, to meat production is marginal, about 0.1%.

Table 5. Estimated red meat production (t) across the three production zones and commercial system, base year 2020/2021

Production zones	Cattle	Goats	Total	% Share
Western	2.6	0.3	2.9	13%
Central	6.4	0.5	6.9	32%
Eastern	11	0.9	11.9	54%
Commercial system	0.2	0	0.2	1%
Total	20.1	1.7	21.9	100%

Source: Estimated based on data from 2016.

Milk is another important livestock product in the Gambia. As for meat production, the Eastern production zone has the highest share of milk produced in the country. More than half of the country's total annual milk production comes from the Eastern production zone, followed by the Central and Western production zones (Table 6). Cattle contribute about 92% to the total annual milk production in the country and the rest, about 8% of the total milk produced, comes from goats though it is noted that goat milk is generally not available in the market and is mainly for home consumption.

Table 6. Estimated annual milk production across the three production zones and commercial system, in millions of litres, (base year 2020/2021)

Production zone	Cattle	Goats	Total	Per cent share
Western	2.6	0.3	2.9	13%
Central	6.4	0.5	6.9	32%
Eastern	11	0.9	11.9	54%
Commercial system	0.2	0	0.2	1%
Total	20.1	1.7	21.9	100%

Source: Estimated based on data from 2016.

According to our estimates, the Eastern livestock production zone contributes about 50% to the total livestock GDP, followed by the Western and the Central zones (Table 7). The widespread backyard and commercial systems contribute about a small amount (3.4%) to the livestock GDP.

Table 7. Estimated annual GDP contribution by production zones and for backyard chicken and commercial system in million GMD,⁵ base year (2020/21)

Production zones	GDP (in million GMD)	Per cent share
Western	1,517.6	28.0%
Central	1,092.4	20.1%
Eastern	2,730.5	50.4%
Backyard chicken	47.4	0.9%
Commercial systems	32.1	0.6%
Total	5,420.0	100.0%

Source: Baseline analysis.

4. Red meat in this case is referring to meat from cattle, sheep and goats

5. GMD = The Gambian dalasi. On 16 May 2022, USD 1 = GMD 53.5904.

2.4 Livestock production, reproduction and financial parameter

The section below summarizes the different livestock production, reproduction and financial parameter across the livestock production zones for cattle, goats, sheep and poultry. The values of these parameter were collected from existing databases and literature reviews and validated by a panel of experts. The databases and literature reviewed include published and unpublished research articles, government and project report documents, government annual plans and reports, national surveys and census reports. To fill the gap in data and validate existing parameter, a series of focus group discussions were conducted with the livestock technical experts, officials and policymakers in the government organizations, livestock project staff, technical experts from donor supported development projects and all other key stakeholders involved in the livestock sector. The baseline situation of the Gambia livestock system is established using the collected parameter listed in the following Tables and Annexe I.

2.4.1 Cattle production, reproduction and financial parameter across the different production zones

Cattle farms' production and reproduction parameter across the three production zones are depicted below (Table 8). The parturition rate of N'Dama cattle across the three production zones ranges between 0.48 and 0.49, while it is on average 0.52 for zebu/Gobra cattle. The overall mortality figures in N'Dama cattle range between 6 and 7%, whereas for zebu breeds, it ranges between 9 and 10%.

The average offtake rate of N'Dama cattle in the Gambia varies between 13 and 14%, while zebu/Gobra cattle varies between 6 and 9%. The zebu/Gobra cattle have an offtake rate of almost half of the N'Dama cattle, possibly attributed to the higher mortality of zebu/Gobra cattle.

Commercial dairy farms have the highest daily milk production, on average about 8 litres/day. The average daily milk production from the N'Dama and zebu/Gobra cattle breeds is about 1.1 and 2.2 litres, respectively. The lactation length of all breeds is about 305 days which is extremely long when compared to the extensive cattle production systems in other African countries (Murutu et al. 2016; Shapiro et al. 2017; Ayalew et al. 2019).

Table 8. Assumed production and reproduction parameter for cattle

Cattle parameter	Production zones/systems							
	Western	Central		Eastern		Urban and peri-urban dairy		
	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	Small	
Demography								
Average herd size ⁶	No.	50	25	53	26	47	23	65
Reproduction								
	Parturition rate (/year)	0.48	0.52	0.49	0.51	0.49	0.52	0.7
	Rate of net prolificacy	1	1	1	1	1	1	1
Mortality	Total (%)	6%	9%	7%	8%	7%	10%	6%
Offtake	Total (%)	13%	9%	14%	6%	13%	6%	24%
Production								
Carcass	Dressing percentage (%)	47%	50%	47%	50%	47%	50%	50%
Live weight (kg)								
Female	Calf	59	77	50	65	50	65	80
	Subadult	155	200	150	195	150	195	200
	Adult	225	293	215	270	208	280	300

6. Calculated based on the 2016 livestock census data.

Cattle parameter	Production zones/systems							
	Western	Central		Eastern		Urban and peri-urban dairy		
	N'Dama	Zebu/ Gobra	N'Dama	Zebu/ Gobra	N'Dama	Zebu/ Gobra	Small	
Male	Calf	62	81	52	68	52	68	90
	Subadult	158	205	156	200	156	200	210
	Adult	300	390	295	380	295	380	400
Milk (litre)								
Length of milking period (days)		305	305	305	305	305	305	300
Milking produced per day (litre/cow)		1.1	2.2	1.1	2.2	1.1	2.2	8
Production (litres)		336	671	336	671	336	671	2,400
Population structure ⁷								
Female	Calf	9%	8%	9%	6%	9%	7%	14%
	Subadult	22%	16%	23%	15%	22%	13%	19%
	Adult	41%	36%	42%	28%	40%	30%	44%
Male	Calf	9%	8%	9%	6%	9%	7%	12%
	Subadult	12%	16%	11%	15%	13%	13%	3%
	Adult	7%	15%	6%	30%	8%	30%	7%

Source: Baseline data.

The cattle financial parameter are presented in Annexe I (Table 42). N'Dama cattle incur a lower veterinary cost and a lower mortality rate than the zebu/Gobra cattle herds. Of the different costs, feed is the most important cost in N'Dama herds, followed by veterinary and labour costs. However, labour is the most important cost in the zebu/Gobra herds. All recurrent costs in all cattle farmers are not covered by a loan.

When it comes to income from cattle production, cattle meat, milk and draught power are the major sources of income. However, there is a difference in the contribution of the different products to the total cattle income depending on the breed of the cattle and the production zone where the cattle live. Except for farmers in the Western production zone, N'Dama cattle farmers in the Central and Eastern zones get the highest share (52 and 54%, respectively) of the total N'Dama cattle income from the meat while milk and draught power are the second and the third important sources of income. Milk contributes the largest income to the total zebu/Gobra cattle system income in all production zones, followed by meat and draught power. Cattle farmers in the Western get the highest income from N'Dama and zebu/Gobra cattle than farmers in the Central and Eastern production zones.

2.4.2 Goat production, reproduction and financial parameter in the different production zones

Production and reproduction parameter of goats in the three production zones indicate moderate levels of parturition and prolificacy in all three production zones (Table 9). Although the parturition and the prolificacy rates can be considered moderate, the benefit appears largely cancelled out due to the very high annual mortality rates (36 to 39%) of goats. The offtake rates, on the other hand, range between 31 and 35%. In terms of a flock structure, adult females take about 44 to 47% of the total flock size. Their number is the largest in the flock (Table 9).

7. Calculated based on the 2016 livestock census data.

Table 9. Assumed production and reproduction parameter for goats

Goat parameter	Production zones/subsystems						
	Western		Central		Eastern		
	Small (1–10)	Female owned	Small (1–10)	Female owned	Small (1–10)	Female owned	
Demography							
Average flock size ⁸	No.	5	5	5	5	5	5
Reproduction							
	Parturition rate/year	1.25	1.25	1.25	1.25	1.25	1.25
	Rate of net prolificacy	1.25	1.25	1.25	1.25	1.25	1.25
Mortality	Total (%)	36%	36%	39%	39%	37%	37%
Offtake	Total (%)	31%	31%	33%	33%	35%	35%
Production							
Carcass	Dressing percentage (%)	55%	55%	55%	55%	55%	55%
Live weight (kg)							
Female	Kid	5	5	5	5	5	5
	Subadult	10	10	10	10	10	10
	Adult	25	25	25	25	25	25
Male	Kid	6	6	6	6	6	6
	Subadult	12	12	12	12	12	12
	Adult	20	20	20	20	20	20
Population structure							
Female	Kid	14%	14%	15%	15%	15%	15%
	Subadult	14%	14%	15%	15%	15%	15%
	Adult	44%	44%	47%	47%	47%	47%
Male	Kid	13%	13%	14%	14%	14%	14%
	Subadult	9%	9%	8%	8%	8%	8%
	Adult	6%	6%	2%	2%	2%	2%

Source: Baseline data.

Financial information (Annexe I, Table 43) shows that goat farmers do not take a loan to finance their recurrent costs. Of all the recurrent costs, veterinary cost is the most important in goat flocks, followed by salaried labour. There is almost no cost spent on feeding goats (Table 41). It is also good to note that no difference in production, reproduction and financial parameter was observed between female owned and the other goat production subsystem.

Goat meat is the sole source of income for farmers in the Central and Eastern production zones. However, in the Western production zone, manure contributes about 15% to the total goat income. Both female owned and the small goat production subsystem depicted the same total and net income result. The highest average net income from a goat flock is observed in the Western production zone with about GMD 4,000, followed by goat flocks in Eastern and Central with about GMD 3,600 and 3,300, respectively. The profit margin of goat production in the Gambia is high, with about 69 to 73% rate.

8. Calculated based on the 2016 livestock census data.

2.4.3 Sheep production and reproduction parameter in the different production zones

The parturition and prolificacy rates of Djallonke sheep across the three production zones were about 0.95 and 1.1, respectively (Table 10). On the other hand, the Sahelian breed depicted a higher parturition rate and similar prolificacy rates as in the Djallonke breed. The parturition and prolificacy rates in the Sahelian breed are about 1.5 and 1.1, respectively. The mortality rates of sheep in the different production zones range between 22 and 36% for the Djallonke breed, while for the Sahelian breed, it ranges between 36 and 53%. The offtake rate for the Djallonke breed in the three production zones range between 17 and 20%, while for the Sahelian breed ranges between 20 and 34%. Like in goats, sheep's male to female ratio has a similar pattern across the three production zones, with adult females dominating a flock.

Table 10. Assumed production and reproduction parameter for sheep

Sheep parameter		Production zones/subsystems								
		Western			Central			Eastern		
	Djallonke	Sahelian	Female owned (Djallonke)	Djallonke	Sahelian	Female owned (Djallonke)	Djallonke	Sahelian	Female owned (Djallonke)	
Demography										
Average flock size	No.	5	10	5	7	5	7	12	5	12
Reproduction										
	Parturition rate/year	0.95	1.5	0.95	0.95	1.5	0.95	0.95	1.5	0.95
	Rate of net prolificacy	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Mortality	Total (%)	24%	36%	24%	36%	53%	36%	22%	44%	22%
Offtake	Total (%)	17%	29%	17%	16%	20%	16%	20%	34%	20%
Production										
Carcass	Dressing percentage (%)	55%	55%	55%	55%	55%	55%	55%	55%	55%
Live weight (kg/animal)										
Female	Lamb	5	8	5	5	8	5	5	8	5
	Subadult	10	15	10	10	15	10	10	15	10
	Adult	22	35	22	22	35	22	22	35	22
Male	Lamb	8	10	8	8	10	8	8	10	8
	Subadult	15	20	15	15	20	15	15	20	15
	Adult	35	40	35	35	40	35	35	40	35
Population structure										
Female	Lamb	9%	14%	9%	11%	15%	11%	9%	16%	9%
	Subadult	13%	9%	13%	13%	8%	13%	13%	10%	13%
	Adult	41%	39%	41%	51%	45%	51%	41%	47%	41%
Male	Lamb	9%	14%	9%	10%	14%	10%	9%	15%	9%
	Subadult	11%	8%	11%	10%	7%	10%	12%	7%	12%
	Adult	16%	17%	16%	4%	11%	4%	16%	4%	16%

Source: Baseline data.

Financial information (Annexe I, Table 44) indicates that sheep farmers do not take a loan to finance their recurrent costs. The Djallonke and Sahelian sheep breeds depicted huge differences in the structure of the production costs. In Djallonke sheep, the veterinary cost is the major cost accounting for about 45% of the total cost. However, in the Sahelian breed, feed is the dominant cost that can account for up to 75% of the total cost. The other important costs in the two breeds are salaried labour and others like water, shed maintenance and more. A significant difference in production, reproduction and financial parameter was not observed in Djallonke breeds that are exclusively owned by females and others owned by men or jointly.

Mutton is the sole source of income for farmers in the Central and Eastern production zones. However, in the Western production zone, manure contributes about 8% to the total sheep income. In terms of total and net income, both female owned Djallonke and the other sheep production subsystem have the same output. The highest average net income from a Djallonke sheep flock was observed in the Western production zone with about GMD 18,600, followed by flocks in Eastern and Central zones. Djallonke breeds presented the highest income per animal than Sahelian sheep in all production zones but in the Eastern. For the Sahelian sheep flock, the highest income per flock was observed in the Eastern production zone, followed by the Western. In the Central zone, Sahelian sheep show a very small income per flock and animal. This could be due to the highest mortality of the Sahelian sheep observed in the Central zone. The profit margin of the sheep production in the Gambia is high, with about 64 to 73% rate for Djallonke. However, for Sahelian sheep breeds, the profit margin can reach as low as 13% and a maximum of about 42%.

2.4.4 Backyard chicken production, reproduction and financial parameter

The backyard chicken is a valuable source of income for smallholder farmers (Table 11, Annexe I, Table 45). The average number of hens in the backyard chicken flock is about 2.2, with 0.6 average cock number and egg production per hen of about 60 eggs. With an average of about three incubations per year, a hen can produce up to 8 marketable chicken with an average weight of 1.5 kg (Table 11). This shows the high productivity of backyard chicken despite the 42% chick and 60% adult mortalities.

Table 11. Assumed production and reproduction parameter for backyard chicken

Backyard chicken parameter	Values
Adults	
Average number of hens	2.2
Average number of cocks	0.6
Age of hens at the start of the laying period (months)	6
Duration of the laying period (months)	30
Age of layers at culling (months)	36
Age of cocks at culling (months)	48
Adult mortality (% per year)	42%
Chicks and growers mortality (% per year)	60%
Production	
Number of eggs laid: hen/year	60
Age of cocks when sold (months)	4
Cocks sold or consumed on-farm/year	8.8
Hens sold or consumed on-farm/year	7.5
Feed consumption and production parameter	

Backyard chicken parameter	Values
Feed consumption layer (g/animal per day)	70
Feed consumption growers and cockerel (g/animal per day)	30
Proportion of total feed supplemented for layers (%)	17%
Proportion of total feed supplemented for growers (%)	17%
Average live weight of chicken (growers) sold (kg)	1
Average live weight of culled hens (kg)	1.2
Average live weight of culled cocks (kg)	1.5
Average dressing percentage	65%
Results	
Principle indicators	
Total number of animals present per hen	7.1
Total number of animals sold or consumed on-farm/year	17.2
Animals sold or consumed on-farm/year per hens	7.84

Source: Baseline data.

Financial information (Annexe I, Table 44) indicates that ruminant farmers and backyard chicken farmers do not take a loan to finance their recurrent costs. A typical backyard chicken farm has a total cost per flock of about GMD 1,288 and makes average total revenue of GMD 2,568, which provides a profit margin of 99.4%. Feed and other maintenance and equipment costs are the dominant sources of recurrent costs. About 87% of the income of backyard chicken farms come from the sale of chicken and culled animals, but egg sales contribute only about 13% to the total chicken income. That is why it is a flaw to use just egg production and income from eggs to evaluate the performance of backyard chicken. The major (87%) income of the backyard chicken come from the selling of live birds.

3 Livestock production constraints and opportunities facilitating growth

3.1 Constraints and facilitating factors in cattle systems

The need to satisfy the increased demand for animal products and ease pressure on natural resources imposed by animals require a detailed and forward looking livestock development strategy. If the anticipated demand for livestock and livestock products has to be met, it will come through increased livestock productivity and not more animals. Therefore, a sustainable increase in the production and productivity of animals follow a synchronized and relentless improvement in livestock feed, health, genetics and marketing. However, the livestock subsector in the Gambia faces a plethora of challenges, including inadequate access to range resources and water, frequent occurrence of disease outbreaks, limited access to veterinary healthcare delivery, low level market linkages and lack of improved germplasm.

In addressing and confronting these challenges, the crucial first step is to explore the existing facilitating factors and constraints to initiate requisite development strategies and target production zones/regions and species that can generate significant economic and social gains without causing irreparable damage to the environment and natural resources.

The following section presents the facilitating factors, challenges and constraints of major commodity value chains, livestock production zones and livestock technology intervention areas.

3.1.1. Facilitating factors in cattle production

Table 12 shows the factors that facilitate cattle systems in the Gambia.

Table 12. Facilitating factors for cattle systems

Category	Production system 1 (Western Region) comprising Kanifing Municipal Council (KMC) and West Coast Region (WCR)	Production system 2 (Central Region) comprising NBR and LRR	Production system 3 (Eastern Region) comprising CRR/N, CRR/S and URR
Feed/fodder	<p>Cattle production (and to a lesser extent small ruminant production) largely depend on the rangelands (or communal grazing areas classified as unimproved pastures) as the main feed source for livestock production. The rangelands are generally the marginal lands that are degraded and not suitable for crop production. During the rainy season, the carrying capacity of the rangeland is adequate to meet the basic feed requirements of the livestock population. The lowland ranges comprise uncultivated/fallow areas and the flood plains. They cover swamp lands (70,393 ha), contributing 19% of all dry season feed for livestock (Food Security Profile of the Gambia 2008)</p> <ul style="list-style-type: none"> • Concentrates are available from feed mills like Uniglobal and the Denton Bridge Groundnut processing plant (groundnut cake), the flour mill in Banjul and lots of imported feed • Basic livestock market infrastructure exist at the Abuiko and Brikama Terminal Markets, where groundnut hay and other livestock feeds are readily available for sale year round • Opportunities exist for the expansion of the dairy industry and commercial poultry production. There is considerable access to feed and water and high demand for livestock and livestock products due to high population densities in the area 	<ul style="list-style-type: none"> • Standing hay (species such as Andropogon) is available in most areas in LRR, particularly in Kiang West, especially during the rainy and early dry season and early rainy season; hence, opportunities exist for enhancing cattle production in the area • Cultivation of groundnuts, sorghum, maize and rice provides crop residue and by-products (cakes, brans, stover etc.) used for livestock feed 	<ul style="list-style-type: none"> • 56% (163,355) of the country's cattle population is located in this area and opportunities exist to improve both the production and productivity of the species • Rice production is significant in the area hence the availability of crop residues and by-products (rice bran and rice straw) Groundnut, sesame and cottonseed cake are also available. Year round feed and water availability in flood plains of Niamina (CRR) • The flood plains in CRR are the traditional dry season grazing areas for both resident and migrant cattle herds from URR and other regions and transhumant herds
Breeding	<ul style="list-style-type: none"> • The overwhelming majority of all cattle (98%) in the Gambia are indigenous and belong to the N'Dama breed. The remaining 2% comprises zebu, 'Gobras' (crosses of N'Dama and zebu cattle) and crossbreds of N'Dama and Jersey, Holstein-Friesian and other European breeds (National Livestock Census 2016) • N'Dama cattle breed is known for its innate tolerance to trypanosomiasis (Murray et al. 1982; Pailing et al. 1992); resistance to dermatophilosis, heartwater, anaplasmosis and babesiosis (Leefflang and Blockamp 1978; Murray et al. 1991); and relative resistance to helminths Claxton and Laperre (1991). Their physiological adaptation to harsh environmental elements make them more resistant to heat, drought and feed scarcity than other breeds • The N'Dama is a dual purpose breed used both for meat and milk production. The breed also provides the draught power requirements for farm operations of crop farmers for the production of 73.4% of all field crops in the Gambia. Draught power requirements for most farm operations (from planting to transporting the produce) are largely met through the usage of animal traction. Draught power is also useful in the rural socio-economy as a means of transport for serving the weekly markets 'Lumooos' and providing transportation networks and (ambulance services) for remote rural communities • The N'Dama cattle breeding program in the Gambia aim to genetically improve the breed to meet future market demands and challenges. The program is implemented through the collaboration of the West African Livestock Innovation Centre (WALIC), the Department of Livestock Services (DLS) and the Gambia Indigenous Livestock Multipliers Association (GILMA). The program operates as an open nucleus breeding scheme at Keneba (WALIC) Wassu, Basse and Yoro-Beri-Kunda (YBK) (DLS) multiplication herds with individual multiplier farmers (GILMA). The schemes serve to produce elite offspring distributed to livestock farmers to enhance animal genetic resources improvement at the community level. The breeding goals have been set to increase milk and meat production for cattle and goats and increase meat production for sheep. In 2017/18, 16 out of 20 selected elite breeding bulls were disseminated to livestock farmers who satisfied the laid down criteria for multiplier farmers 		

Category	Production system 1 (Western Region) comprising Kanifing Municipal Council (KMC) and West Coast Region (WCR)	Production system 2 (Central Region) comprising NBR and LRR	Production system 3 (Eastern Region) comprising CRR/N, CRR/S and URR)
	<ul style="list-style-type: none"> A relatively mild climate provides the opportunity for the production and breeding of pure breeds, including European breeds of cattle (and their crosses with the indigenous N'Dama breed [F1]) 	<ul style="list-style-type: none"> Large numbers of cattle are available for breeding 	
Animal health	<ul style="list-style-type: none"> The New Animal Health Bill 2019 and Amendments to the Gambia Veterinary Council Act 2000 are now before the National Assembly for endorsement. Endorsement of these new laws will provide opportunities for improving the delivery of veterinary services to livestock owners. According to data from the National Livestock Census 2017, the overwhelming majority of cattle owners (94.9%) have access to veterinary services that are provided by the DLS (85.1%) and paraveterinarians (6.8%) 		
Infrastructure/ marketing and others	<ul style="list-style-type: none"> Generally, this region has better livestock infrastructure, veterinary institutions and marketing outlets. The headquarters of the veterinary services, the Central Diagnostic Laboratory, the HQ of WALIC, the Central Abattoir and the main terminal markets in Abuko and Brikama are all located in this area Market potential due to having high densities of the urbanized population with higher purchasing power 	<ul style="list-style-type: none"> Primary livestock markets with basic infrastructure are located in Fass Njaga Choi, Ndugu Kebbeh, Farafenni and Bureng (weekly markets known as 'Loumos') 	<ul style="list-style-type: none"> Limited livestock and veterinary infrastructure available in Yorro-Beri-Kunda, Sololo and Basse. Thriving primary livestock markets located in Wassu, Brikama Ba, Sare Bojo and Sare Ngai (weekly markets known as 'Loumos')

3.1.2. Challenges/constraints in cattle systems

The cattle subsector in the Gambia faces several challenges linked to the predominant, extensive production system characterized by limited access to production inputs, feed, water, quality veterinary service and livestock infrastructure exacerbated by market imperfections that stifle performance and growth. The situation is further compounded by the overwhelming use of indigenous breeds of low productivity that have evolved partly/most likely as a result of/in response to nutritional and disease stress (Loum B, Expert opinion 2021). See Table 13 below.

Table 13. Challenges of cattle production by production zone

Category	Production System 1 (Western Region)	Production System 2 (Central Region)	Production System 3 (Eastern Region)
Feed and Fodder	<ul style="list-style-type: none"> • Dwindling range resources due to demographic pressures and the mushrooming of excessive numbers of housing estates on marginal lands that were hitherto used as grazing lands • High cost of concentrates, groundnut hay and other crop residues and by-products • Very few commercial dairy farms are involved in fodder cultivation 	<ul style="list-style-type: none"> • Scarcity of water, feed/ fodder during the dry season (November to June). Lots of standing hay and palatable grass species are lost due to frequent bush fires 	<ul style="list-style-type: none"> • This region has the highest concentration of cattle in the Gambia • Acute shortage of water for livestock in some areas during the dry season • The traditional dry season grazing areas in the lowland ecologies (the flood plains) are being converted to rice fields and vegetable gardens, often resulting in user conflicts • The convergence of many cattle herds in the dry season grazing areas in Niamina (migration and transhumance) results in stiff competition for feed and water
Animal health	<ul style="list-style-type: none"> • Over time, the rangelands that constitute the primary feed source for livestock in the Gambia are severely degraded due to overgrazing, bush fires and the absence of improvement strategies such as enrichment planting to replace palatable grass species. Communal ownership of the rangelands precludes any meaningful/efficient management of the range of resources given that they belong to the community at large. • Over the years, the vegetative cover and composition of grasses on the pastures have changed considerably due to overgrazing and the frequent occurrence of bush fires. Local fodder tree species such as Pterocarpus Erinaceous, Acacia Albida and other species are declining in the forested areas due to over exploitation /lopping and intensive logging. • Towards the end of the dry season, scarcity of feed becomes so acute that all animals lose weight due to starvation. During this period, in most regions, livestock depend largely on crop residues, swamp grazing and browsing on fodder trees for their sustenance. <ul style="list-style-type: none"> • Among the most important challenges facing the livestock industry in the Gambia is the frequent occurrence of disease outbreaks resulting in tremendous economic losses that significantly affect the livelihoods, income and sustenance of rural households. Annually, considerable economic loss accrues to the national socio-economy from the high level of mortalities from animal diseases • In 2016, losses due to animal diseases were USD 22,977,133 National Livestock Census (2016) • The critical shortage of veterinarians in the public sector (only two veterinary officers enlisted in the government of the Gambia payroll is a significant challenge) 		

Category	Production System 1 (Western Region)	Production System 2 (Central Region)	Production System 3 (Eastern Region)
Breeding	<ul style="list-style-type: none"> Apart from disease incidence, the threat to erosion of animal genetic resources diversity in the Gambia is compounded by encroachment (human settlements, double cropping of rice, cashew plantations etc.) on traditional grazing areas and stock routes and the destruction of the habitat of vectors of diseases allowing gene pool dilution of indigenous breeds as they are gradually replaced by more productive but less tolerant imported breeds/crosses These problems are further compounded by the low levels of efforts to improve the genetic characteristics of local breeds through rigorous selection There is no ex-situ or in vitro cryoconservation of animal genetic materials such as semen, ova, embryo or tissue cells developed in the country for the improvement/conservation of indigenous breeds 	<ul style="list-style-type: none"> Very few trained and qualified AI technicians (11 trained and equipped by WALIC in 2017) with the required equipment and supplies to provide AI services to farmers 	<ul style="list-style-type: none"> Low productivity of indigenous cattle
Marketing	<ul style="list-style-type: none"> Inadequate infrastructure for the collection, storage, processing and transportation of milk despite high demand in the area (high population densities and developed tourist industry) Milk marketing is mainly through informal marketing channels 	<ul style="list-style-type: none"> Milk marketing is mainly through informal marketing channels 	<ul style="list-style-type: none"> Very few mini dairies engaged in collecting, processing and marketing milk and milk products exist in the area Milk marketing mainly through the informal marketing channels

3.2 Constraints and facilitating factors in goat systems

Goat production compares favourably to sheep farming in the Gambia and it also plays a vital role in the livelihood of the rural populations. Similarly, sheep are also raised to generate income and meet the rural households' food, nutrition and other requirements. For these reasons, the ownership of goats is even more diverse and widespread than that of sheep.

The production system practised is mainly extensive and traditional; hence, productivity is generally low. The thriving market for roast meat ('Affra') is largely satisfied through the slaughter of goats from all regions (particularly from CRR/N and S and URR) and countries in the subregion. The demand for goats and chevon (goat meat) by far exceeds the available domestic supply. As a result, the country heavily relies on imports to cover the deficit, particularly slaughter stock.

Low productivity is premised on several challenges that require appropriate policies and strategies to ensure growth. Addressing these challenges will improve performance, enhance food and nutrition security and create employment opportunities.

3.2.1 Facilitating factors in goat systems

Table 14 shows the factors that facilitate goat production.

Table 14. Facilitating factors in goat production in different production zones of the Gambia

Category	Western Region	Central Region	Eastern Region
Feed and fodder	<ul style="list-style-type: none"> • Opportunities exist for upscaling goat dairy farms in this region, given that concentrates are available from feed mills like Uniglobal and the Denton Bridge Groundnut processing plant (groundnut cake), the flour mill in Banjul. In addition, lots of feed is imported into the country • Basic livestock market infrastructure exists at the Abuko and Brikama Terminal Markets, where groundnut hay and other livestock feeds are readily available for sale year round • Opportunities exist for the expansion and intensification of goat production given that there is considerable access to feed and water and high demand for roasted goat meat ('Affra'), due to high urbanization and high population densities in the area 	<ul style="list-style-type: none"> • Standing hay (species such as Andropogon spp, forage trees such as Acacia spp) are available in most areas in LRR, particularly in Kiang West, especially during the rainy and early dry seasons and early rainy season • Cultivating groundnuts, sorghum, maize and rice provides crop residues and by-products (cakes, brans, stover etc.) used for livestock feed 	<ul style="list-style-type: none"> • 52% of the goat population of the country is located in this area and opportunities exist for the improvement of both the production and productivity of the species • Rice production is significant in the area hence the availability of crop residues and by-products (rice bran and rice straw) Groundnut, sesame and cottonseed cake are also available. Year round feed and water availability in flood plains of Niamina (CRR)
Animal health	<ul style="list-style-type: none"> • Field institutions provide basic veterinary healthcare • Existence of field institutions and qualified personnel • The West African Dwarf goat (WAD)—the indigenous breed is well adapted to the environment (limited supply of feed and water and coping with diseases and endo- and ectoparasites) 		
Breeding	<ul style="list-style-type: none"> • The overwhelming majority of the goat population in the Gambia comprises the indigenous West African Dwarf goat breed. Out of the total goat population, 99.5% belong to the WAD breed and the remaining are Sahelians and crossbreeds The Gambia National Livestock Census (2016). Although the WAD breed is considered to be of low productivity, it is well adapted to the environment. It will continue to survive when other breeds succumb to diseases and feed and water related stresses 	<ul style="list-style-type: none"> • Large numbers of goats are available for breed improvement programs and the satisfaction of the demand for goats for religious and socio-cultural events 	<ul style="list-style-type: none"> • Large numbers of goats are available for breed improvement programs and the satisfaction of the demand for goats for religious and socio-cultural events

Category	Western Region	Central Region	Eastern Region
Infrastructure/ marketing and others	<ul style="list-style-type: none"> Generally, this region has better livestock infrastructure, veterinary institutions and marketing outlets. The headquarters of the veterinary services, the Central Diagnostic Laboratory, the HQ of WALIC, the central abattoir and the main terminal markets in Abuko and Brikama are all located in this area Market potential due to having high densities of the urbanized population with higher purchasing power and the sharp rise in demand for goats and roasted goat meat 	<ul style="list-style-type: none"> Primary livestock markets with basic infrastructure are located in Fass Njaga Choi, Ndugu Kebbeh, Farafenni and Bureng (weekly markets known as 'Loumos') 	<ul style="list-style-type: none"> Thriving primary livestock markets in Wassu, Brikama Ba, Sare Bojo and Sare Ngai (weekly markets known as 'Loumos')
Common	<ul style="list-style-type: none"> Women and the youth play an essential role in goat farming. There is scope to develop women goat entrepreneurs by augmenting agricultural projects, NGOs and the private sector The overwhelming majority of farmers involved in goat production are women and the youth 		

3.2.2 Challenges/constraints of goat systems

Goat production in the Gambia is faced with many challenges linked to the predominant, extensive production system characterized by limited access to production inputs, feed, water, quality veterinary service and livestock infrastructure exacerbated by market imperfections that stifle performance and growth. The situation is further compounded by the overwhelming use of the indigenous WAD goat breed of low productivity that is highly susceptible to PPR (see Table 15).

Table 15. Challenges of goat production by production zone

Category	Production system ¹ (Western Region)	Production system ² (Central Region)	Production system ³ (Eastern Region)
Feed and fodder	<ul style="list-style-type: none"> Over time, the rangelands that constitute the primary feed source for livestock in the Gambia are severely degraded due to overgrazing, bush fires and the absence of improvement strategies such as enrichment planting to replace palatable grass species. Communal ownership of the rangelands precludes any meaningful/efficient management of the resources, given that they belong to the community at large Over the years, the vegetative cover and composition of grasses on the pastures have changed considerably due to overgrazing and the frequent occurrence of bush fires. Local fodder tree species such as <i>Pterocarpus erinaceus</i>, <i>Acacia albida</i> and other species are declining in the forested areas due to over exploitation/lopping and intensive logging Towards the end of the dry season, scarcity of feed becomes so acute that all animals (including goats) lose weight due to starvation. During this period, in most regions, sheep production depends largely on crop residues, swamp grazing and browsing on fodder trees for the sustenance of productivity 		
	<ul style="list-style-type: none"> Dwindling rangeland resources due to demographic pressures and the mushrooming of excessive numbers of housing estates on marginal lands that were hitherto used as grazing lands High cost of concentrates, groundnut hay and other crop residues and by-products Very few commercial goats farms are involved in fodder cultivation or range resources improvement programs 	<ul style="list-style-type: none"> Scarcity of water, feed/ fodder during the dry season (November to June). Lots of standing hay and palatable grass species are lost due to frequent bush fires 	<ul style="list-style-type: none"> Thorough comprehensive/systematic monitoring and inventory of the carrying capacity of the rangelands was conducted in 1986 by the USAID funded mixed farming and resource management project for the CRR/N, CRR/S and URR only (Production zone 3). These regions, in 2016, had the highest concentration of goats in the Gambia
Animal health	<ul style="list-style-type: none"> Among the most important challenges facing goat production in the Gambia is the frequent occurrence of disease outbreaks resulting in tremendous economic losses that significantly affect the livelihoods, income and sustenance of rural households. It is observed that higher percentages of goats succumb to the disease during outbreaks when compared to sheep. (Mortality and morbidity rates are much higher.) Annually, considerable economic loss accrues to the national socio-economy from a high level of mortalities from PPR. Yearly, mortality from this disease alone can reach 50% resulting in losses equivalent to USD 10,446,197. National Strategy for the Control and Eradication of PPR in the Gambia, Ministry of Agriculture, Banjul(2017) The critical shortage of veterinarians in the public sector (only two veterinary officers enlisted in the government of the Gambia payroll is a significant challenge) Major diseases affecting goats are PPR and pasteurellosis 		
Marketing	<ul style="list-style-type: none"> Generally, there is an acute shortage of livestock market infrastructure at the weekly and terminal markets, where most goats are traded. Trading in goats is encumbered with many market imperfections underpinned by middlemen colluding with dealers to the detriment of goat farmers who have very little bargaining powers 		

3.3 Constraints and facilitating factors in sheep systems

Sheep production plays a vital role in the livelihood of the rural populations in the Gambia. They are raised to generate income and meet the food, nutrition and other requirements of rural households. In this regard, they are also sold to meet other family needs and fulfil the owners' socio-cultural obligations. The short cycle of the sheep makes it easier to sell and they, therefore, serve as ready sources of income for the purchase of food during lean periods. The precarious and erratic nature of rainfall coupled with the concomitant crop failures observed in recent years are forcing the farmers to rely more on sheep (goats and poultry) to meet rural households' food, nutrition and other requirements. Furthermore, given the prolific nature and short generation interval, sheep significantly enhance food security and poverty alleviation in rural communities. The production system practised is mainly extensive and traditional; hence productivity is generally low. The low productivity is due to several challenges requiring appropriate policies and strategies to ensure the subsector's growth.

The demand for sheep and mutton by far outsteps the available supply. As a result, the country relies heavily on imports to cover the deficit. However, the intensive production of fattened rams targeting the 'Tobaski' market (local name for the Muslim feast of 'Eid al Adha') is also very popular. At the national livestock show and 'Tobaski' ram sale in 2017, a total of 33,090 'Tobaski' rams were presented for sale to the public at the livestock show ground in Abuko. The rams presented for sale originated from the regions within the country and also from countries in the subregion (the republics of Senegal, Mali and Mauritania). Loum National strategy and action plan for animal genetic resources in the Gambia (2019). Addressing these challenges will improve the sheep subsector performance, enhance food and nutrition security and create employment opportunities.

3.3.1 Facilitating factors in sheep systems

Table 16 shows the factors facilitating sheep production.

Table 16. Facilitating factors in sheep production in different production zones of the Gambia

Category	Western Region	Central Region	Eastern Region
Feed and fodder	<ul style="list-style-type: none"> • Opportunities exist for upscaling sheep fattening programs targeting the 'Tobaski' given that local and imported feeds are available • Basic livestock market infrastructure exists at the Abuko and Brikama terminal markets, where groundnut hay and other livestock feeds are readily available for sale year round • Opportunities exist for the expansion and intensification of sheep production. There is considerable access to feed and water and high demand for sheep and mutton due to high population densities in the area 	<ul style="list-style-type: none"> • Standing hay (species such as <i>Andropogon</i> spp) is available in most areas in LRR, particularly in Kiang West, especially during the rainy and early dry season and early rainy season; hence, opportunities exist for enhancing sheep production in the area • Cultivation of groundnuts, sorghum, maize and rice provides crop residues and by-products (cakes, brans, stover etc.) used for livestock feed 	<ul style="list-style-type: none"> • 64% of the country's sheep population is located in this area and opportunities exist to improve both the production and productivity of the species • Rice production is essential in the area hence the availability of crop residues and by-products (rice bran and rice straw). Year round feed and water availability in flood plains of Niamina (CRR)

Category	Western Region	Central Region	Eastern Region
Animal health	<ul style="list-style-type: none"> • The occurrence of PPR is less severe in sheep than in goats • Wide network of field institutions provide basic veterinary healthcare • Existence of field institutions and qualified personnel • Djallonke sheep—the indigenous breed is well adapted to the environment (limited supply of feed and water and coping with many diseases and endo- and ectoparasites) • On average, a female sheep can give birth to 1–2 kids per delivery 		
Breeding	<ul style="list-style-type: none"> • The overwhelming majority of the sheep population in the Gambia comprises the indigenous Djallonke breed. About 96.4% belong to the Djallonke breed and the remaining 4.4% are Sahelians and crossbreeds (Djallonke with Sahelians) The Gambia National Livestock Census (2016). Although the Djallonke breed is considered to be of low productivity, it is well adapted to the environment and will continue to survive during diseases outbreaks and feed and water related stresses 		
	<ul style="list-style-type: none"> • This area is now upscaling the intensification/commercialization of sheep production using crosses of Djallonke and Sahelian sheep (using breeds such as Ladoum, Touabire and Peul-Peul) targeting the niche ‘Tobaski’ markets where they fetch premium prices 	<ul style="list-style-type: none"> • Large numbers of sheep are available for breed improvement programs and satisfying the demand for sheep, particularly for ‘Tobaski’ and other socio-cultural events 	
Infrastructure/ marketing and others	<ul style="list-style-type: none"> • Generally, this region has better livestock infrastructure, veterinary institutions and marketing outlets. The headquarters of the veterinary services, the Central Diagnostic Laboratory, the HQ of WALIC, the central abattoir and the main terminal markets in Abuko and Brikama are all located in this area • Market potential due to having high densities of the urbanized population with higher purchasing power and the sharp rise in demand for sheep and mutton 	<ul style="list-style-type: none"> • Primary livestock markets with basic infrastructure are located in Fass Njaga Choi, Ndugu Kebbeh, Farafenni and Bureng (weekly markets known as ‘Loumos’) 	<ul style="list-style-type: none"> • Limited livestock and veterinary infrastructure available in Yorro-Beri-Kunda, Sololo and Basse. Thriving primary livestock markets are located in Wassu, Brikama Ba, Sare Bojo and Sare Ngai (weekly markets known as ‘Loumos’)
Common	<ul style="list-style-type: none"> • Women and the youth play an essential role in sheep farming. There is scope to develop women sheep entrepreneurs by augmenting agricultural projects, non-governmental organizations and the private sector • The overwhelming majority of farmers involved in sheep production are women and the youth 		

3.3.2 Challenges/constraints in sheep systems

Sheep production in the Gambia faces many challenges linked to the predominant, extensive production system characterized by limited access to production inputs, feed, water, quality veterinary service and livestock infrastructure exacerbated by market imperfections that stifle performance and growth. The situation is further compounded by the overwhelming breeding of the indigenous Djallonke of low productivity that has evolved partly/most likely as a result of/in response to nutritional and disease stress Loum Expert opinion (2021). See Table 17 below.

Table 17. Challenges of sheep production by production zone

Category	Production system ¹ (Western Region)	Production system ² (Central Region)	Production system ³ (Eastern Region)
Feed and fodder	<ul style="list-style-type: none"> The rangelands that constitute the main source of feed for livestock in the Gambia are overtime severely degraded due to overgrazing, bush fires and the absence of improvement strategies such as enrichment planting to replace palatable grass species. Communal ownership of the rangelands precludes any meaningful/efficient management of the rangeland resources given that they belong to the community at large Over the years, the vegetative cover and composition of grasses on the pastures have changed considerably due to overgrazing and the frequent occurrence of bush fires Towards the end of the dry season, scarcity of feed becomes so acute that all animals (including sheep) lose weight due to starvation. During this period, in most regions, sheep production depends largely on crop residues, swamp grazing and browsing on fodder trees for the sustenance of productivity 		
	<ul style="list-style-type: none"> Dwindling rangeland resources due to demographic pressures and the mushrooming of excessive numbers of housing estates on marginal lands that were hitherto used as grazing lands High cost of concentrates, groundnut hay and other crop residues and by-products Very few commercial sheep farms are involved in fodder cultivation 	<ul style="list-style-type: none"> Scarcity of water, feed/ fodder during the dry season (November to June). Lots of standing hay and palatable grass species are lost due to frequent bush fires 	<ul style="list-style-type: none"> Thorough comprehensive/systematic monitoring and inventory of the carrying capacity of the rangelands was conducted in 1986 by the USAID funded mixed farming and resource management project for the CRR/N, CRR/S and URR only (Production Zone 3). These regions, in 2016, had the highest concentration of sheep in the Gambia (18,912; 29,461 and 62,010 respectively). The convergence of many transhumant sheep flocks in parts of CRR/N results in stiff competition for feed and water
Animal health	<ul style="list-style-type: none"> Among the most important challenges facing sheep production in the Gambia is the frequent occurrence of disease outbreaks resulting in tremendous economic losses that significantly affect the livelihoods, income and sustenance of rural households. Annually, considerable economic loss increases to the national socio-economy from a high level of mortalities from PPR. Yearly, mortality from PPR alone can reach 50% resulting in losses equivalent to USD 10,446,197 National strategy for the control and eradication of PPR in the Gambia, Ministry of Agriculture, Banjul (2017) The critical shortage of veterinarians in the public sector (only two veterinary officers enlisted in the government of the Gambia payroll is a significant challenge) Major diseases affecting sheep are PPR and pasteurellosis 		
Marketing	<ul style="list-style-type: none"> Generally, there is an acute shortage of livestock market infrastructure at the weekly and terminal markets, where most sheep are traded. Trading sheep is encumbered with many market imperfections underpinned by middlemen colluding with dealers to the detriment of sheep farmers who have very little bargaining powers 		

3.4 Constraints and facilitating factors in the backyard and commercial chicken systems

Traditional chicken production is the predominant chicken production system in the Gambian farming system and it is extensive. Birds are poorly housed, fed and provided with little or no veterinary care. Small flocks (10 to 15 birds) that are in most cases owned and managed by women and children are kept in the backyard of the household of their owners. They are confined during the night in kitchens or locally made shelters to minimize predation, while during the daytime, birds are left to scavenge in the backyards; and supplementary feeds such as millet, coos, brans and household leftovers are provided for the birds in the evenings when they return to the households. The chicken flocks are made up of local breeds that are low producers of meat and eggs compared to exotic breeds. However, given their size, the birds are easier to sell or slaughter for home consumption and for that reason, they serve as a ready source of income and protein for many households in rural communities Ministry of Agriculture (2018).

According to the National Livestock Census (2016), females owned 66.8% of the chicken. Analysis by region revealed that WCR had the highest number of females (203,532) and males (127,884), respectively.

Almost every Gambian family in the rural areas rear poultry. Commercial farmers keep improved breeds both broilers and layers. All commercial farmers use complete feeds. Nearly all forms of complete poultry feeds are imported into the country.

3.4.1 Facilitating factors in backyard poultry systems

Table 18 shows the factors facilitating backyard poultry production in the Gambia.

Table 18. Facilitating factors in backyard poultry production

Category	Backyard chicken production	
Feed	<ul style="list-style-type: none"> Scavenging is the main source of feed for backyard poultry; hence feed cost is negligible Feed cost is negligible due to better use of crop residues, agricultural by-products and leftovers from the households Women farmers who depend on poultry production could increase their income and improve their nutritional status by supplementing 20% of the required daily nutrient intake of 120 g (24 g daily) 	
Breed	<ul style="list-style-type: none"> The Gambia has many indigenous breeds like Firgi; Tunguneh and all others are simply called 'local breeds' because they are not characterized Generally, the local breeds have a good brooding capacity and mothering ability Self-propagation 	
Health	<ul style="list-style-type: none"> The birds are very hardy and have adapted to their environment overtime and they are more tolerant to the prevalent diseases than imported breeds Vaccination against Newcastle disease (NCD), treatment using dewormers and dusting powder against infestation could significantly increase and improve production and productivity 	
Marketing	<ul style="list-style-type: none"> High demand for eggs and poultry meat due to urbanization and high human population densities 	<ul style="list-style-type: none"> Backyard poultry production plays a significant role during socio-cultural and religious festivities. This influences prices upwards
	<ul style="list-style-type: none"> A significant proportion of the population prefer backyard poultry meat to imported chicken due to the free range system and the belief in organic farming. This influences prices upwards 	
	<ul style="list-style-type: none"> Backyard poultry meat prices are higher than that of layers and broilers in the market 	

Category	Backyard chicken production
Others	<ul style="list-style-type: none"> • No technological intervention is required • One of the good initiatives for poverty eradication and income generation for poor farmers • Low initial investment but higher income return • A unit can be started with as low as two chicken to a large flock • Backyard poultry farming acts as savings at the household level because when the need arises, it can be easily converted to cash • Boost up family income and nutritional status of women and children

3.4.2 Challenges/constraints of backyard poultry systems

Table 19 shows some of the constraints of backyard poultry farming.

Table 19. Challenges/constraints in backyard poultry production

Category	Backyard poultry production
Feed	<ul style="list-style-type: none"> • Dependent on free range/scavenging, with little feed supplements. During scavenging, birds could be lost through predation or theft
Breed	<ul style="list-style-type: none"> • No initiatives for conservation or characterization of local breeds • No mechanism for the hatching of eggs of local breeds • Birds are poor reproducers and are not selected for their potential productivity • Low feed converters
Health	<ul style="list-style-type: none"> • High mortality rates during NCD and other disease outbreaks and high predation cause heavy losses • Lack of or limited awareness of veterinary healthcare, housing and management issues • NCD is a major constraint to traditional poultry production as mortalities during outbreaks can reach 100% and wipe out whole flocks
Marketing	<ul style="list-style-type: none"> • Low levels of awareness and sensitization of farmers about the market potential of backyard poultry meat and eggs • High demand for traditional poultry meat in the greater Banjul area, where traditional poultry is hardly reared and the supply is low • No formal, organized market is set up in this sector • Discontinuation of field and market days organized for poultry farmers made to coincide with feasts such as Christmas, Ramadan, Eid al Fitr, Yamul Ashura (Muslim feasts) etc. • Have meagre carcass weight compared to the imported and or locally reared exotic breeds, therefore, have lesser lose in economic performance than the imported breeds • Interviewed female farmers indicated that they neither eat nor sell eggs because they need more chicks hatched and some added they did not know they could eat the eggs because they thought it is only meant for hatching and it is unhygienic

3.4.3 Facilitating factors in commercial layer systems

Table 20 lists some of the factors facilitating the production of commercial layers.

Table 20. Facilitating factors in commercial layer production

Category	Commercial layer production
Feed	<ul style="list-style-type: none"> • This region has a highly developed tourist industry with hotels, bars and restaurants hence the high demand for locally produced eggs • There exists in the country a cadre of well-trained experts in animal feed production and some of them are still in active service while others have retired. This wealth of knowledge should be utilized for feed preparations • Experts on feed preparations using locally available feed resources to prepare feed for layers could reduce the cost of layer feed • Improve and increase the capacity of local feed mills and millers
Breed	<ul style="list-style-type: none"> • Crossing improved breeds with the indigenous hardy birds
Health	<ul style="list-style-type: none"> • Commercial layer farmers should use the advisory and healthcare protocols and treatment from veterinarians/ paraveterinarians/ field extension staff workers • Timely vaccinations and revaccination against deadly diseases; endo- and ectoparasite control
Marketing	<ul style="list-style-type: none"> • Increase in egg consumption by the consumers due to an increase in their income • Shops as outlets • More eggs are seen during trade fairs • Eggs are made available in supermarkets and minimarkets, indicating growing demand • Eggs are an assured product as it is not tampered with • People buy eggs at farm gates
Others	<ul style="list-style-type: none"> • The government target of a 15% increase in the supply of livestock products to the tourism sector by 2016. FAO poultry sector review of the Gambia (2008). Over 465 livestock dealers registered nationally • The Gambia's chicken population in 2016; 937,951 • Favourable poultry policy by the local government <p>Sincere and interested entrepreneurs</p>

3.4.4 Challenges/constraints in commercial layer systems

Table 21 lists the challenges faced in the production of commercial layer chicken.

Table 21. Challenges/constraints in commercial layer production

Category	Western Region	Central Region	Eastern Region
Feed	<ul style="list-style-type: none"> • All commercial layer farmers depend on imported feeds for running their farms • Feeds prices are affected by currency fluctuations • Layer farmers are unable to prepare their rations • Finished feedstock affects production since farmers resort to improvising • Locally available feed are used mainly for human consumption • Non quality assurance of feed purchased • Very few or non-existent local feed mills and feed millers 		

Category	Western Region	Central Region	Eastern Region
Breed	<ul style="list-style-type: none"> • Most day old chicks are purchased from Senegal because parent stock for hatching eggs is a big setback since there is only one known breeder located in the Western Region • Non availability of day old chicks 		
Health	<ul style="list-style-type: none"> • Recurrent disease outbreaks, particularly NCD and occurrence of emerging diseases 		
Marketing	<ul style="list-style-type: none"> • Markets flooded with cheap imported eggs stifling local production • Spoilage of chicken and eggs as a result of inadequate storage facilities • Poor market linkages with producers • Cheaper imported eggs distort the market 		
Others	<ul style="list-style-type: none"> • Risky business since it deals with lives • Costs could be expensive depending on the number of birds and location, making the initial cost very high • Poor infrastructure 		

3.4.5 Facilitating factors for commercial broiler systems

Table 22 shows the factors facilitating the production of commercial broiler chicken.

Table 22. Facilitating factors in commercial broiler production

Category	Commercial broiler production
Feed	<ul style="list-style-type: none"> • Hotels, bars and restaurants demand locally produced broilers • There exists in the country a cadre of well-trained experts in animal feed production and some of them are still in active service while others have retired. This wealth of knowledge should be used for feed preparations • Experts on feed preparations using locally available feed resources to prepare feed for layers could reduce the cost of broiler feed
Breed	<ul style="list-style-type: none"> • Crossing improved breeds with indigenous hardy birds
Health	<ul style="list-style-type: none"> • Commercial broiler farmers can use the advisory and healthcare protocols and treatment from veterinarians/paraveterinarians/field extension staff workers • Timely vaccinations and revaccination against deadly diseases; endo- and ectoparasite control
Marketing	<ul style="list-style-type: none"> • Increase in broiler consumption due to an increase in income • Shops as outlets • More broilers are seen during trade fairs • Broilers are available in supermarkets and minimarkets, indicating growing demand • People buy broilers at farm gates
Others	<ul style="list-style-type: none"> • The government target of a 15% increase in the supply of livestock products to the tourism sector by 2016. FAO poultry sector review of the Gambia (2008) • Nationally 465 livestock dealers are registered • The Gambia's chicken population in 2016 reached 937,951 • Favourable poultry policy by the local government • Sincere and interested entrepreneurs
Commercial layer farms	Example: Green Gold; Lammeh Kunda Poultry Farm; Romar farms Gambia Ltd; Rue Chicken Farm; ML's Poultry Farm; Tijan Jarju at work @ Gamchick Poultry Farm

3.4.6 Challenges/constraints in commercial broiler systems

The constraints/challenges facing both layer and broiler producers are very similar and are associated with difficulties with importing day old chicks and feed, frequent disease outbreaks and inadequate market infrastructure, among others. Table 23 shows the constraints experienced in the commercial production of broilers.

Table 23. Challenges/constraints in commercial broiler production

Category	Western Region	Central Region	Eastern Region
Feed	<ul style="list-style-type: none"> • All commercial broiler farmers depend on imported feeds for running their farms • Feeds prices are affected by currency fluctuations • Farmers are unable to prepare their rations • The bulk feed component of poultry rations is mainly composed of maize. Maize is also consumed by many households as a staple food hence there is competition between feed for poultry and food for the households • Non quality assurance of feed purchased • Very few or non-existent local feed mills and feed millers 		
Breed	<ul style="list-style-type: none"> • Most day old chicks are purchased from Senegal because parent stock for hatching eggs is a big setback since there is only one known breeder located in Western Region • Non availability of day old chicks • Importing day old chicks is expensive 		
Health	<ul style="list-style-type: none"> • Recurrent disease outbreaks, particularly NCD and occurrence of emerging diseases 		
Marketing	<ul style="list-style-type: none"> • Markets flooded with cheap imported broilers stifling local production. Given that the production cost of chicken and poultry products is much cheaper in the European Union (EU) and USA, it is cheaper to buy imported poultry products from the mentioned countries in the Gambia than locally produced products. As a result, there are abundant imported poultry products in the local markets and sale outlets to the detriment of local producers • Spoilage of broiler chicken as a result of inadequate storage facilities and erratic electricity supply • Poor market linkages with producers • Cheaper imported broilers distort the market 		
Others	<ul style="list-style-type: none"> • Costs could be high depending on the number of birds and location, making the initial cost very high • Poor infrastructure 		

4 Priority institutions and policy constraints and opportunities

The demand and prices for animal sourced foods (ASF) in the Gambia show an increasing trend due to population growth, rapid urbanization and income growth. However, the productivity of the predominant indigenous livestock breeds is low. Thus, the country relies heavily on imports of live animals, processed chicken meat and eggs and dairy products to meet the growing demand.⁹

The low productivity is due to several challenges hence the need to put in place appropriate policies and strategies to enhance the growth of the subsector, thereby contributing to increased food availability, participation of the private sector and creation of employment opportunities, particularly for the youth and women and girls.

The livestock subsector policies are included in the Agriculture and Natural Resources (ANR) 2017–2026 policy,⁹ which was subjected to a comprehensive review in 2016/17. The most recent policy statement of the GoTG on the livestock subsector stresses the objective of transforming the livestock subsector from a predominantly traditional low-input low-output production system to a competitive, commercial, value chain based and private sector led subsector. It further aims to facilitate private sector engagement along the entire poultry value chain, particularly in the hatchery industry, breeding, feed mills, cold storage, processing and product development. The policy and institutional constraints and opportunities presented in this section are a continuation of the initial assessment report of the Gambian livestock sector (see Rich et al. 2020).¹⁰

4.1 Animal health

The priority animal health strategy emphasizes on continuously reviewing and updating animal health and welfare legal and regulatory frameworks, including emerging animal health issues.

In this context, following a request from the Hon Minister of Agriculture in 2017, the African Union–InterAfrican Bureau for Animal Resources (AU–IBAR) agreed to assist the GoTG in reviewing and updating its obsolete veterinary legislation. Subsequently, the Minister appointed a five person task force to spearhead the process, while AU–IBAR designated an expert to provide technical support to the task force. This initiative was completed in 2019 and the new Animal Health Bill 2019 and amendments to the Gambia Veterinary Council Act 2000 were forwarded to the national assembly for endorsement.

The priority animal health strategies also focus on the development and strengthening of institutional structures (public and private) for animal health, the development of human resources to fill the acute shortage of veterinarians and laboratory scientists and technicians and strengthening the epidemic surveillance system and establishing an early warning system and emergency preparedness and contingency plans.

⁹ This document has not yet been validated by the government of the Gambia.

¹⁰ More detailed description of policy matrices are in Annexe II.

The high prevalence of diseases in the country presents a significant challenge to the livestock subsector. The existence of wetlands close to human settlements attracts many migratory birds, some of which may be implicated in transmitting viruses. Porous borders and uncontrolled movement of people and transport at the level of the commercial farms are other sources of livestock disease transmission.

Animal health service delivery is constrained by a lack of laboratory capacity for controlling the quality of veterinary medicines and a lack of a dedicated department responsible for delivering animal health and production services to smallholder farmers and regulating the subsector. Therefore, an important policy objective is to improve animal health delivery and reduce the impact of animal diseases on livestock production, productivity, welfare and public health. This requires:

- strengthening the capacity of veterinarians and paraveterinarians;
- properly training and equipping the field staff to directly communicate livestock disease data to the central disease and surveillance monitoring unit;
- strengthening border control mechanisms;
- improving the capacity and infrastructure of the existing laboratories;
- adopting well defined roles for the public and private veterinary service providers in conformity with the recommended World Organisation for Animal Health (OIE) sanitary mandate;
- providing an enabling environment to encourage the private sector to operate in rural areas through providing incentive packages;
- strengthening public–private partnership (PPP) in delivery of animal health services;
- revisiting/reviewing the outdated acts and regulations;
- introducing adequate legislation to regulate the use of antimicrobials;
- resolving the administrative constraints that inhibit animal health delivery and
- establishing a system that ensures quality control and regulation of services.

4.2 Animal genetic resources (AGR) and breed improvement

The Gambia has national policies on the management of animal genetic resources. The policy objectives are to progressively diversify the livestock sector by broadening the number of species, breeds, products and by-products. The strategies proposed to achieve this objective are the continuous exploitation of indigenous species, which have proven to be well adapted (to the livestock production being practised) and the introduction of exotic species and breeds to ensure diversification of the agricultural production base and the satisfaction of the needs of the country. The indigenous breeds are well adapted to the predominant extensive livestock production system that is characterized by low inputs, inadequate feed and water and limited access to veterinary services yet they generally display high levels of tolerance to diseases and produce meat and milk for the owners and the market. However, their productivity is low.

However, the programs' continuous implementation is constrained by institutional weaknesses at the national and local levels. This includes:

- weakened research and development capabilities;
- lack of human, financial and material resources;

- lack of organization of the actors involved in the pure and crossbreeding schemes;
- lack of a legal and regulatory framework with regards to crossbreeding (risking dilution of the N'Dama's genetic traits) and market weakness in the market structures;
- operations and policy formulations concerning importing exotic breeds and animal products.

The policy for breed improvement should focus on the Genetic Improvement Program being implemented by WALIC and DLS (for the indigenous breeds) and the establishment of a national dairy cattle breeding scheme (genetic upgrading through crossbreeding using AI aimed at providing genetically superior crossbred cows) and the development of PPP arrangements and guidelines to support crossbreeding programs using AI. In the process, it is appropriate to continue to cautiously introduce exotic pure dairy breeds for increased milk supply and provide adequate and timely financial support, including credit, to develop sustainable cattle production and encourage private sector participation.

It is also appropriate to adopt policies that promote the sustainable use of Djallonke and West African Dwarf goats and facilitate their conservation, breeding and multiplication through private and public/private partnerships. Benefits will also accrue to strengthen the adoption of productivity enhancing technologies, including climate change adaptation measures, through the agropastoral farmer field school approach and promote the establishment of exotic sheep and goat breeding farms. Additionally, it is relevant to strengthen animal breeders' capacity, reinforce the genetic improvement programs and encourage PPPs.

4.3 Animal nutrition and land availability

Adequate and balanced availability of feed and fodder is a prerequisite for increasing livestock production. Over the years, the Gambia has pursued a policy to ensure efficiency and balance between livestock and the fragile environment. The strategies used to achieve the policy objective were to promote active community participation in the management and use of the range resources, improve and increase access to potential grazing areas and the availability of watering facilities there.

Under the traditional land tenure system administered by district authorities, rights to crop land are inheritable and relatively secure (Rich et al. 2020). However, the traditional tenure system is strained by population growth and crop land expansion at the expense of grazing. In most parts of the country, cattle tracks have been encroached on, limiting access to grazing and watering points. The recent proliferation of rice development projects in CRR and URR has resulted in encroachment on traditional dry season grazing areas (also on stock routes) in the flood plains of Niamina district and other localities with similar ecologies. Furthermore, demarcated cattle tracks leading from the rangelands to watering points are also blocked by vegetable garden fences. This has resulted in user conflicts between herders and crop farmers/vegetable and horticultural producers. Hence there is an urgent need for policy formulation and direction to reduce current conflicts and prevent their escalation.

The review conducted by the Gambia Strategic Program on Climate Resilience (SPCR) concluded that the Gambia does not have a land policy (Bensouda 2013).

By virtue of its colonial past, land tenure in the Gambia is based on a dual system statutory and customary. The statutory system governs the freehold and leasehold titles introduced by the British and is based on English law. The customary tenure evolved from the traditions and practices of the indigenous communities that allow communities to distribute or sell land but discriminate against women heads of household who constitute the majority in rural areas. SPCR reported that land availability is exacerbated by uncontrolled urbanization and haphazard land allocation. The claims and needs for land and the expansion of residential properties tend to conflict with other requirements for land (particularly land for agriculture). Some of the issues are related to urban sprawl into valuable agricultural land and uncontrolled land encroachment, including encroachment into wetlands. Numerous problems exist concerning

land administration, outdated maps and the absence of a physical plan. The different statutes that regulate the management of these lands are the State Lands Act 1992 and the Lands (Provinces) Act.

The goal of a national land policy should be to ensure efficient and equitable, utilization and climate resilient management of the Gambia's land resources for poverty reduction, wealth creation, environmental enhancement and overall socio-economic development. The government should revisit and modify the land tenure system in a socially acceptable manner and provide efficient management of rangeland resources.

The government also has an active role in making land available for feed production and grazing, establishing feed quality standards and monitoring, establishing policy instruments, regulations and incentives to define the rights to grazing and watering, controlling resources and supporting the private sector investment in animal feeding.

4.4 Dairy

N'Dama cattle are dual purpose animals producing both milk and meat. The average milk yield is very low (about 1.1 litres per day and 305 lactation days). To increase milk production of the indigenous breed, policies, strategies and legislation should be in place to promote productivity by enhancing technologies to increase meat and milk production. The technologies aimed at increasing meat and milk output should include sustainable feeding practices through forage production, conservation and use of crop residues, disease control and strengthening the genetic improvement program being implemented by DLS and WALIC. AI is practised by very few livestock farmers (mostly in the intensive and semi-intensive dairy sector). To provide genetically superior crossbred cows, policies aimed at establishing a national dairy cattle breeding scheme (genetic upgrading through crossbreeding using AI) should be prioritized. Policies and strategies should be promoted to develop PPP arrangements and guidelines to support crossbreeding programs using AI.

4.5 Poultry

For the enhancement of traditional/backyard village poultry production systems, the policy should be through the promotion of improved management practices (disease control, housing, supplementary feeding etc.), improved access to feeds (improving knowledge, quality and affordability) and the development of input and output markets to increase the sale and consumption of poultry products. Biosecurity measures are generally not taken into consideration in extensive backyard/traditional poultry production systems in the Gambia.

For the commercial/modern poultry subsector, there is a need for a comprehensive policy that will control the flooding of the market with cheap imports of chicken and poultry products that stifle local production. The fact that it is not that local producers cannot satisfy the demand, it is that they cannot do it cheaply. The engagement of the private sector along the entire poultry value chain, particularly in the hatchery industry, feed mills, cold storage, processing and product development, should be enhanced through tax breaks and other incentives.

4.6 Hides and skins

Presently, there is no policy regarding hides and skins and the industry has undergone a serious decline. In the 1980s, there was a tannery owned by GAMTAN at the abattoir, where hides and skins were treated and exported to both Portugal and Spain. Later, the tannery was sold to an individual, but operations stopped. Currently, there are informal exports by individuals to Nigeria, Sierra Leone and Ghana. Local leather craftsmen make use of available hides and skins.

There is a need to put in place policies that will encourage value addition to hides and skins rather than the export of primary produce. These could include the re-establishment of a tannery as it would

earn the Gambia foreign exchange, improve the livelihoods of farmers/individuals and create job opportunities. The tanning of hides and skins and exports to Europe (Portugal and Spain mainly) was a viable business and was only discontinued due to stringent sanitary and phytosanitary measures (SPS) measures put in place by the EU.

4.7 Live animals and meat

The policy should ensure an efficient marketing channel that will enhance the supply of local meat and meat products to the thriving tourist industry. The cross border trade in live animals should be regulated to improve traceability and provide reliable statistics. Basic livestock infrastructure such as quarantine stations and well equipped livestock markets should also be provided in the rural communities.

4.8 Breed improvement

The policy for breed improvement should focus on the genetic improvement program being implemented by WALIC and DLS (for the indigenous breeds) and the establishment of a national dairy cattle breeding scheme (genetic upgrading through crossbreeding using AI aimed at providing genetically superior crossbred cows) and the development of PPP arrangements and guidelines to support crossbreeding programs using AI. In the process, it is important to cautiously introduce exotic pure dairy breeds for increased milk supply and provide adequate and timely financial support, including credit, to develop sustainable cattle production and encourage private sector participation.

The policy should also promote the sustainable use of Djallonke and West African Dwarf goats and facilitate their conservation, breeding and multiplication through private and public/private partnerships. It would be beneficial to strengthen the adoption of productivity enhancing technologies, including climate change adaptation measures, through the agropastoral farmer field school approach and promote the establishment of exotic sheep and goat breeding farms.

4.9 Agricultural research and human resource

The current capacity and staffing levels of the National Agricultural Research Institute (NARI) (which has the mandate for livestock research) and WALIC are inadequate to bring about the anticipated transformation of the livestock subsector. Furthermore, the DLS is constrained by inadequately qualified staff (with only two veterinarians), insufficient funding and a lack of guidelines to deliver efficient extension services.

Therefore, it is urgent to develop policies to support livestock research and extension services to facilitate innovation and adoption of appropriate technologies; build institutional capacity for effective delivery of livestock research and extension services. The DLS and the Ministry of Agriculture need to build inhouse capacity to conduct detailed research and quantitative planning exercises. This is also necessary to implement, monitor, evaluate and formulate new policies and review existing policies.

The DLS should strengthen (and build staff capacity) the livestock information and epidemiology unit to enhance its capacity to generate (in addition to epidemiological data) reliable social and economic data necessary for policy analyses and investment planning.

4.10 Gender and the livestock subsector

Given the prominent role women and girls play in the production of small ruminants, poultry and short cycle livestock species, policies need to be elaborated to enhance the participation of women in policy formulation for the livestock subsector. In this regard, the removal of socio-cultural barriers and strengthening of women's participation in all decision-making processes, eliminating all forms of gender based violence and providing better economic opportunities that will lead to improved status and well-being for families should be encouraged.

The problems women and youth face in agricultural production are immense, including:

- Limited access to land, credit, appropriate technologies.
- Ownership and control over animals and income derived from them. Moreover, in cases where the ownership of animals and/or control over income from certain livestock is currently in the hands of women, for instance, small ruminants and poultry, in the face of future development efforts, future ownership and control over income are not guaranteed. This stems from empirical evidence that reveals the tendencies of men to take over traditional women commodities and value chains when these become financially lucrative.
- Information, knowledge and skills related to livestock production, food safety, nutrition, biosecurity and zoonosis.
- Social and cultural barriers that limit their engagement and voice.
- Limited access to veterinary services for the species they own, namely goats and backyard poultry.
- Lack of market information and limited access to markets.
- Gaps in skills and knowledge to participate in all nodes of the livestock value chain and industry.

In the light of these constraints and consistent with the national commitments under the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW), the gender mainstreaming policy strand will emphasize the following policy threads:

a Land tenure

- There would be a thorough review of the land tenure system in the Gambia, considering all the past studies on the tenure system.
- Legislation would be enforced to avail women of full ownership of land, particularly land for development purposes. This will also enable them to use such land as collateral to secure loans from banks.
- The need to synchronize the various land tenure systems to address development needs regardless of gender is paramount to the economic use of resources and does not conflict with social justice.

b Livestock development policies

i. Gender mainstreaming in livestock value chains with the objective of:

- Ensuring that both men and women benefit from these value chains and trade-offs across different value chains (i.e. focus on having a combination of livestock enterprise developments that benefit both men and women).
- Eliminating the drudgery of labour on women as livestock caregivers may come with increased herds and productivity from animal health and breed improvement efforts. This involves technologies around feeds and feeding, production and marketing that lessen the workload on women, hence the ability to balance their household productive and reproductive roles.
- Building the capacity of women and men to understand and participate in livestock and livestock product markets, i.e. understanding how the markets are working, market opportunities and challenges and how to circumvent the challenges.

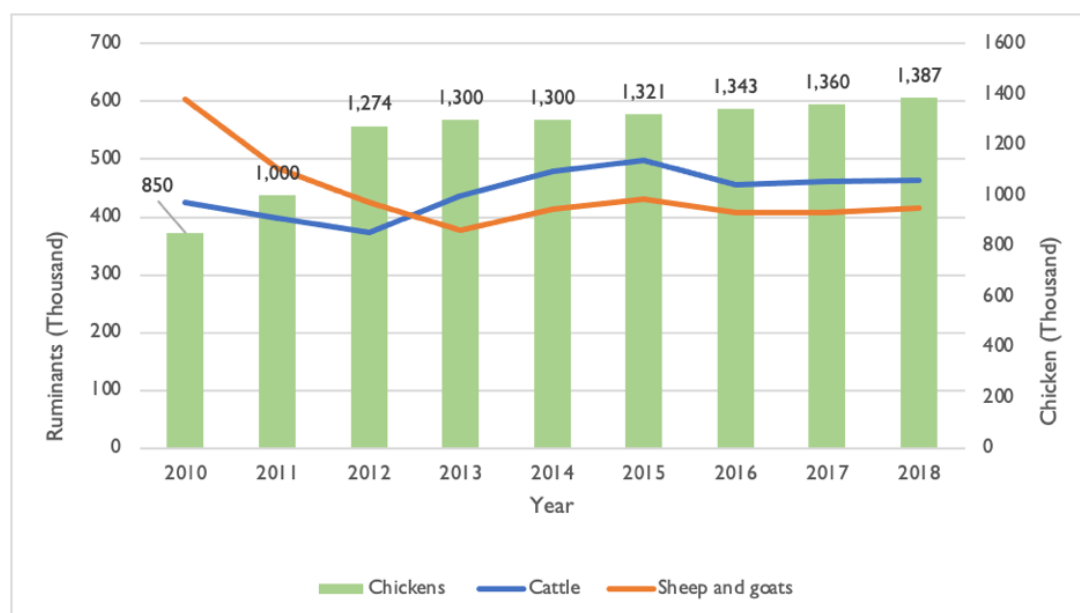
- Building livestock extension and animal health systems that are sensitive to the needs of women and men in terms of circumventing gender norms and challenges that bar them, particularly women, from receiving and benefiting from extension and animal health systems.
- Building the collective agencies of women and men by promoting collective action in areas where the acquisition of inputs, access to markets and market information, access to knowledge and access to savings and credit facilities are better made collectively rather than individually.
- Transforming norms that bar women and youth from accessing, using, owning and benefiting from livestock (animals, products and markets).

5 Livestock contribution to the Gambia

5.1 Past livestock trends in the Gambia

The poultry sector has been growing rapidly, with a growth in the number of birds of over 60% from 2010 to 2018 (Figure 3) based on data from FAOSTAT (FAO 2021). The change in the population of cattle and shoats (sheep and goats) has been erratic, with a slight decline in stocks from their reported 2015 peak. The population of sheep and goats decreased by 31% between 2010 and 2018; most of this reduction occurred in 2013 and the population has been roughly stable since.

Figure 3. Stocks of cattle, chicken, sheep and goats in the Gambia, 2010–2018.



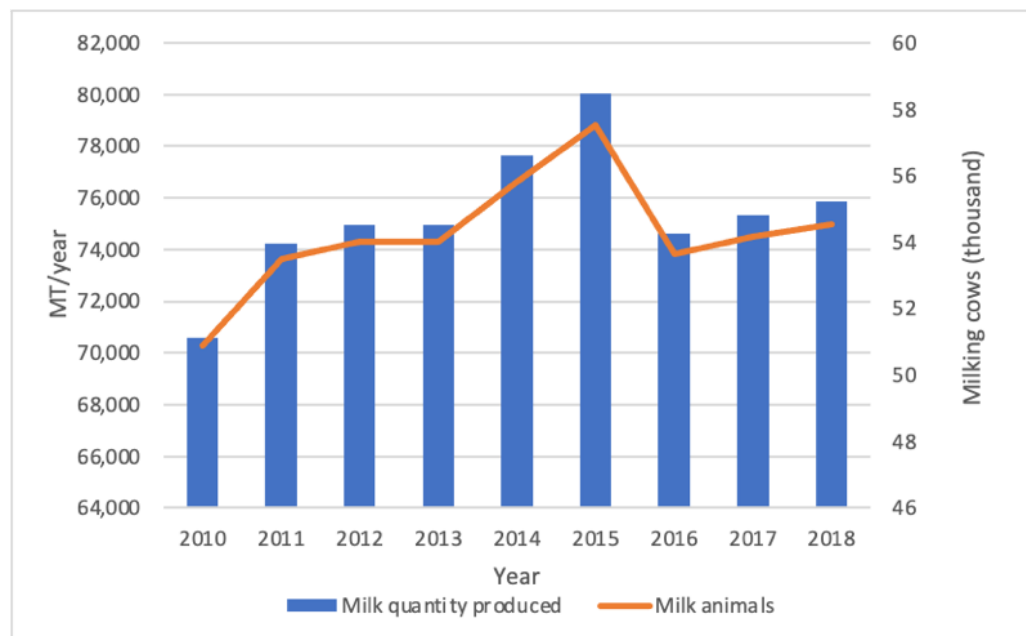
Source: FAO (2021).

Available data on the number of milking animals and the amount of milk production is highly inconsistent. The FAO data show that the Gambia had about 54 thousand lactating cattle that produced 75,869 t of milk in 2018 (Figure 4).

In contrast, results from the 2016 national livestock census indicate that the country has a total of 44,385 lactating N'Dama cows producing a total of 20.3 million litres of milk annually valued at GMD 1.02 million, 52% of which is consumed at home while the rest is sold (Loum 2019). Even if the number of milking cows during the census may have been lower due to the death and sale of animals during 2012–2013, due to the contagious bovine pleuropneumonia (CBPP) outbreak, the FAO data assumes a higher level of productivity.

The FAO data assumes 3.8 litres of milk per cow per day which is more than twice the value from the census data (about 1.5 litres) and still higher than what is documented in the literature, including Jaitner et al. (2003) and Touray (2016). Figure 4 shows the re-estimated milk production level in the Gambia can be estimated using FAO data for the number of milking cows but assuming an average milk yield of 1.4 litres/cow per day (Figure 4), as was the case during the census. Local production accounts for 55–70% of the milk consumed in the country, with imports filling in the gap between domestic demand and supply.

Figure 4. Number of milking cows and quantity of milk produced (t/year, 2010 to 2018) in the Gambia.



Source: FAO (2021).

The stock figures reported by FAOSTAT also are somewhat at odds with those reported in the 2016 livestock census and summarized by Loum (2019). The livestock census as shown in Table 24 reports cattle stocks at over 160 thousand heads less than FAO estimates (Table 24), whereas for the sheep and goats, the livestock census values are around 92 thousand head more than FAOSTAT. For chicken, FAOSTAT reports 400 thousand more chicken than the livestock census figures.

Table 24. Stocks, offtakes and carcass weight for selected livestock products from the 2016 livestock census

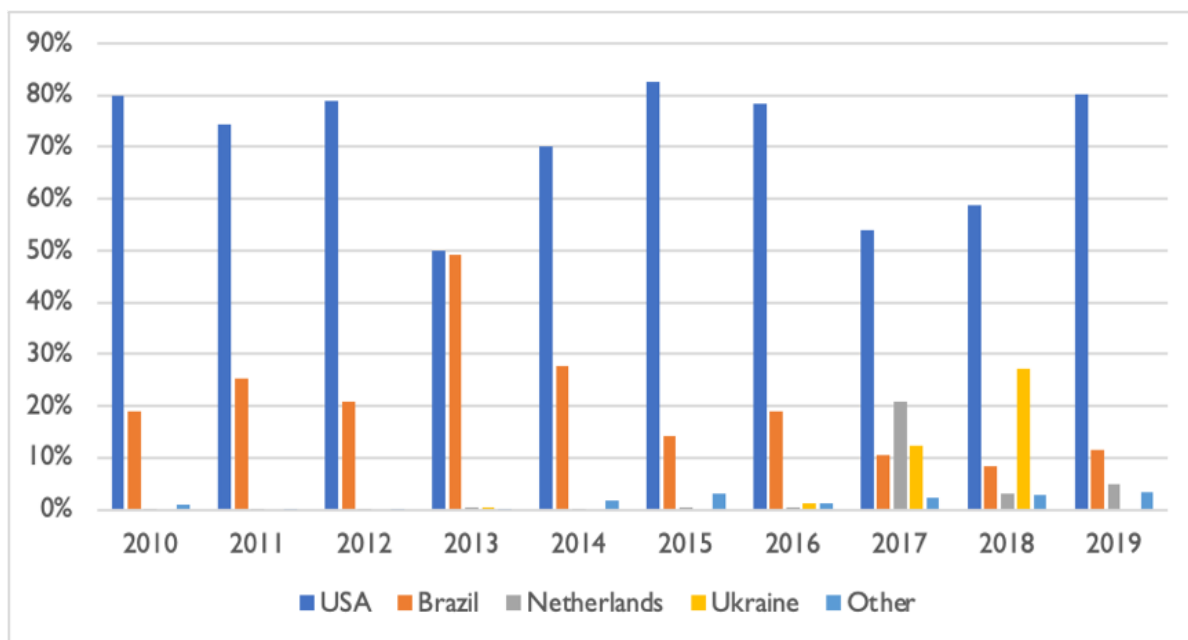
Species	Population	Offtake rate (%)	Number of animals sold	Average carcass weight (kg/animal)	Estimated meat produced (t)
Cattle	292,837	11.9	34,848	110	3,833
Sheep	172,662	22.3	38,504	14	539
Goats	328,336	25.1	82,412	14	1,154
Chicken	937,951	40	375,180	1	375

Source: Loum (2019).

Poultry imports to the Gambia have increased during the past decade. Import figures reported by UN Comtrade (2017) (and reported in FAOSTAT) have some discrepancies.¹¹ Instead, this section will use export data of partners that sell products to the Gambia to analyse import trends. The Gambia relies significantly on international trade for certain livestock products, particularly poultry and increasingly beef. Most poultry imports come from overseas markets, particularly the USA and Brazil, with growing exports from the Netherlands and Ukraine (Figure 5). Imports comprise the majority of available poultry meat.

11. Import figures reported by UN Comtrade (and reported in FAOSTAT) suggest import unit values for beef and poultry products that are not realistic (typically between USD 0.15–0.40/kg) for either product, suggesting some coding error of official data or under invoicing of imports (see <https://bit.ly/3pLZRnf> for more explanation).

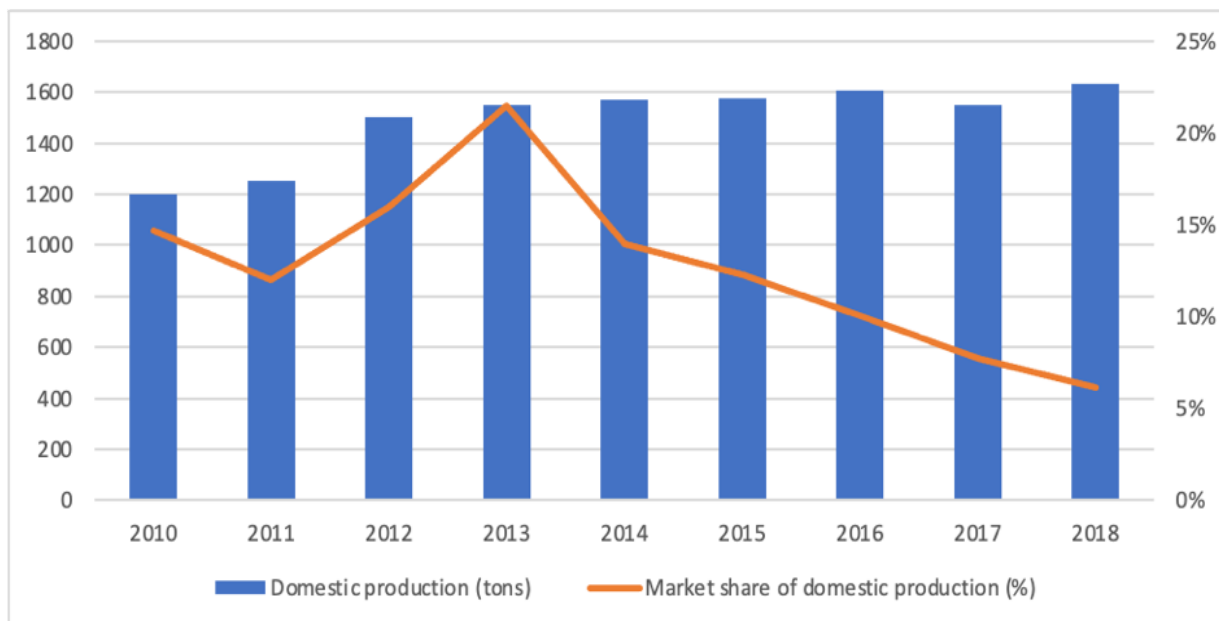
Figure 5. Trends in market share (on volume basis) of poultry imports to the Gambia, 2010–2019.



Source: UN Comtrade (2017).

Considering the 2016 livestock census figures and a domestic offtake rate of 40%, domestic production comprised about 2.5% of total availability. Using FAOSTAT values (Figure 6) suggests a higher domestic market share, but trends clearly show a declining trend since 2013.

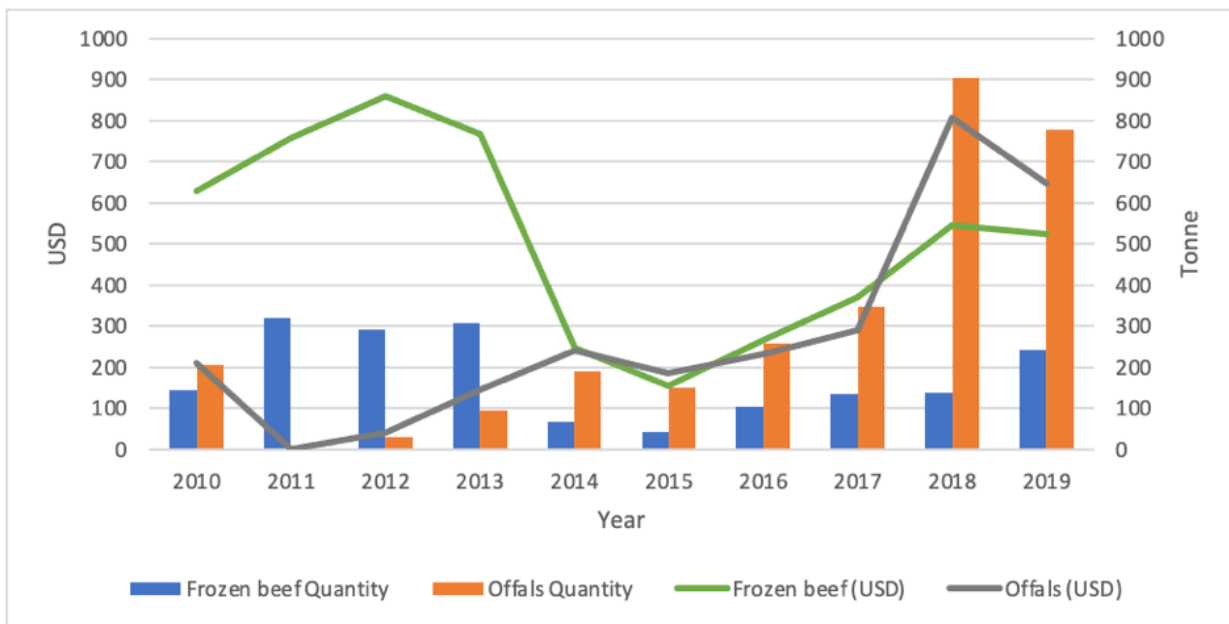
Figure 6. Domestic production and market share of poultry meat in the Gambia, 2010–2018.



Source: FAOSTAT.

There has been a sharp rise in imports of offal in the beef subsector since 2012. The quantity of offal’s imported has increased from 30,578 kg to over 778 thousand kg from 2012 to 2019 (Figure 7). Fresh beef cuts are imported irregularly, while there has been steady growth in frozen beef imports, with volumes increasing sixfold in 2019 compared to the imports in 2015.

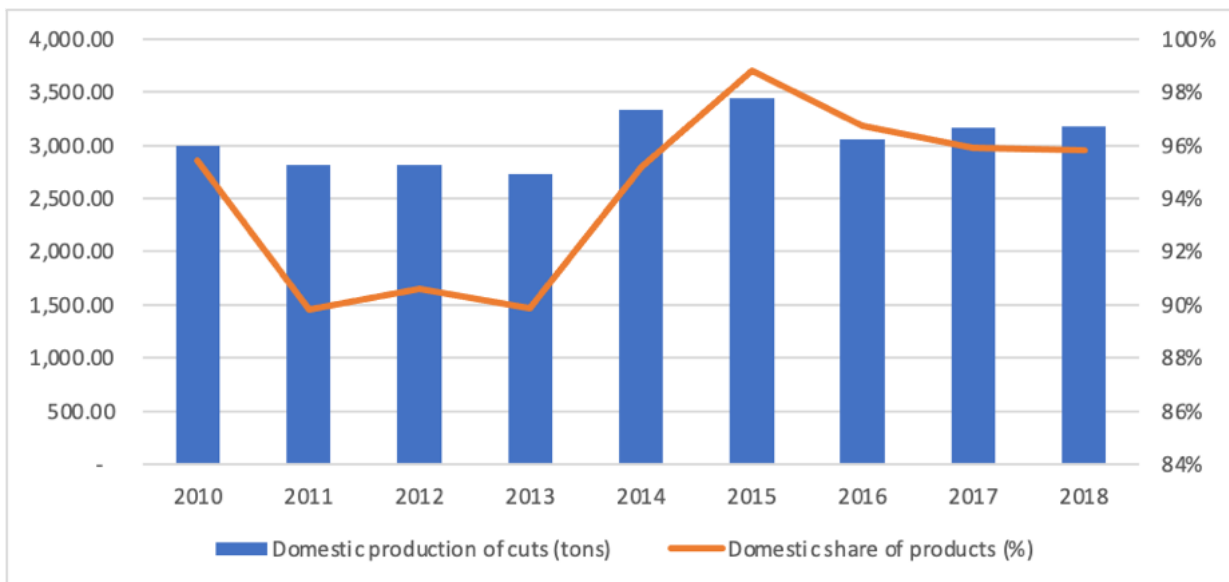
Figure 7. Imports of beef products to the Gambia, 2010–2019.



Source: UN Comtrade (2017) for HS 0201, 0202 and 0206 using export data to the Gambia as reported by partners.

Domestic beef production largely satisfies local consumption of cuts, with the share of domestically sourced beef cuts rising based on FAO data (Figure 8). Figure 8, which adjusts carcass weight figures into usable meat cuts about 40% of live weight—compared with imports.

Figure 8. Domestic production of beef cuts and market share in the Gambia, 2010–2018.

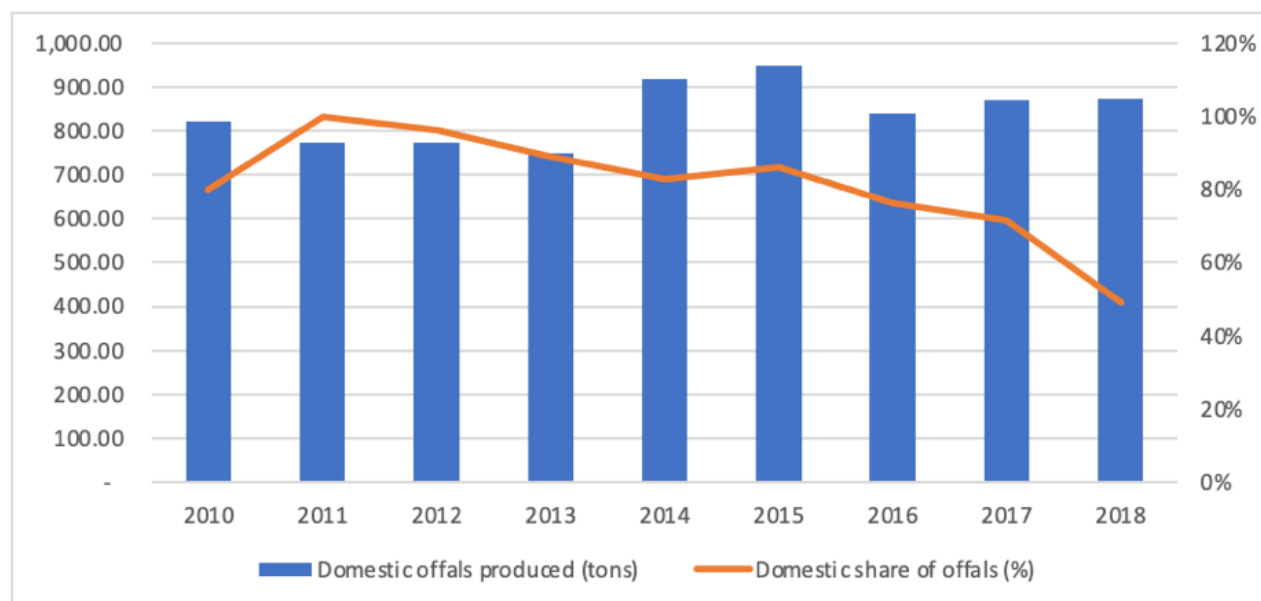


Source: FAO 2021.

Estimates of beef cuts are based on live animal numbers and weights, adjusted by the percentage (40%) of the live weight devoted to cuts.

On the other hand, imports of offal are gaining market share, with 2019 imports comprising nearly half of the Gambian consumption (Figure 9).

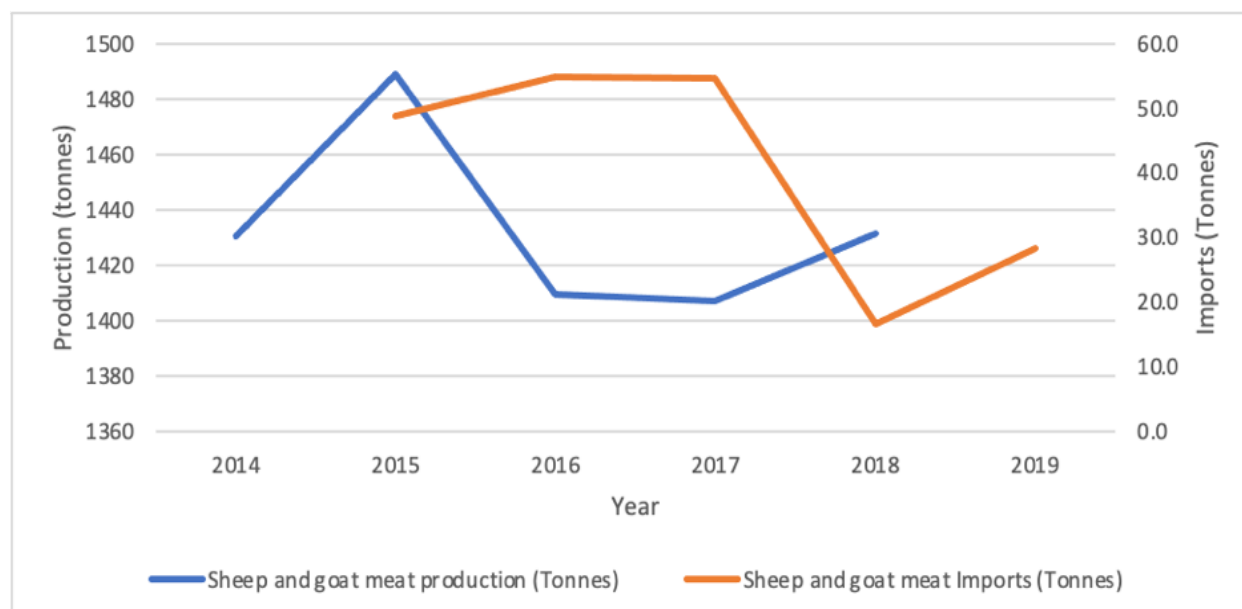
Figure 9. Domestic production of offal's and market share, 2010–2018.



Source: FAO 2021. Estimates of offal production are based on live animal numbers and weights, adjusted by the percentage (11%) of the live weight devoted to offal.

Data on sheep and goat meat are scarce. FAOSTAT does not report meat data beyond 2013, with offtake rates ranging between 23–29% for goats from 2010 to 2013 and 24–36% for sheep over the same period. We applied the offtake rates and carcass yields for sheep and goats reported by Loum (2019) in Table 24 from the 2016 livestock census to derive domestic sheep and goat meat estimates for 2014–2018 (Figure 10). Imports of sheep and goat meat are relatively modest (Figure 10) and include 2015–2019 where data were available. From 2015 to 2018, the trend shows an inverse relationship between domestic production and imports.

Figure 10. Estimates of domestic production and imports of sheep and goat meat.



Source: UN Comtrade (2017).

The PROGEBE project summarized the per capita demand for certain livestock products (beef, sheep and goat meat and dairy products) for selected periods in the 1980s, 1990s and 2000s (Table 25).

Table 25. Historical trends in per capita consumption and availability of beef, sheep and goat meat and milk (kg/person)

Product	Average 1987–89	Average 1997–99	Average 2007–09
Beef	4.7	3	2.6
Sheep and goat meat	1.3	0.6	1
Dairy products	24.2	21.1	30

Source: PROGEBE final report.

The 2015 integrated household survey (IHS) provides additional insights on consumption (Table 26). According to the Gambia Bureau of Statistics (2015), monthly household expenditure on food was GMD 6,870 in 2015, of which over 12% were spent on livestock products. Based on a rough calculation of derived unit values from reported purchases, we estimate per capita consumption of red meat at 5.1 kg and poultry at 5.8 kg. The poultry figures reasonably approximate availability, while the red meat consumption figures are nearly double that of computed availability.

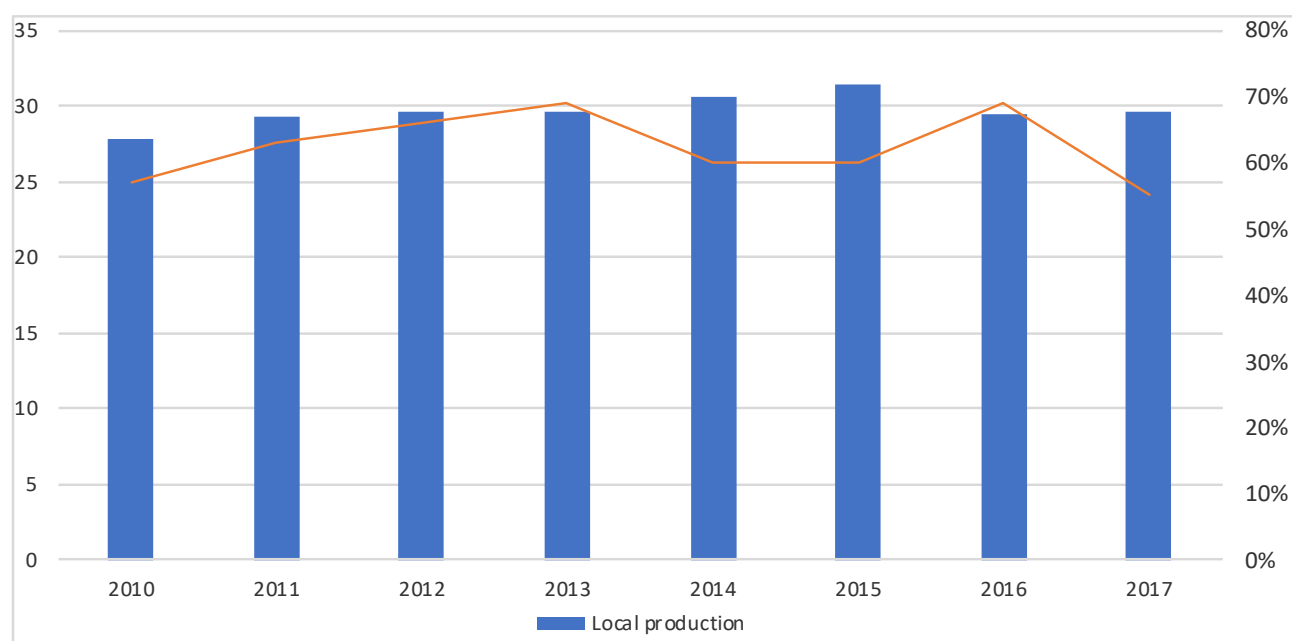
Table 26. Per capita consumption and availability of selected livestock products based on the 2015 IHS, production and trade figures

Product	% of food expenditure	Monthly HH expenditure (GMD)	Per capita monthly expenditure (GMD)	Weighted unit value of consumption (GMD/kg)	Implied annual HH consumption (kg)	Annual per capita consumption (kg)	National consumption (t)	Derived availability (t)
Red meat	4.9	337	65	153	26.5	5.1	10,716	5,177
Poultry	3.4	234	45	94	29.9	5.8	12,091	12,824
Dairy and eggs	4.5	309	60					

Sources: The Gambia Bureau of Statistics (2015) and figures from Tables 1–7.

The re-estimated milk production level in the Gambia (Figure 11) using FAO data for the number of milking cows but assuming an average milk yield of 1.5 litres/cow per day, indicates that local production accounts for 55–70% of the milk consumed in the country. Imports fill in the gap between domestic demand and supply.

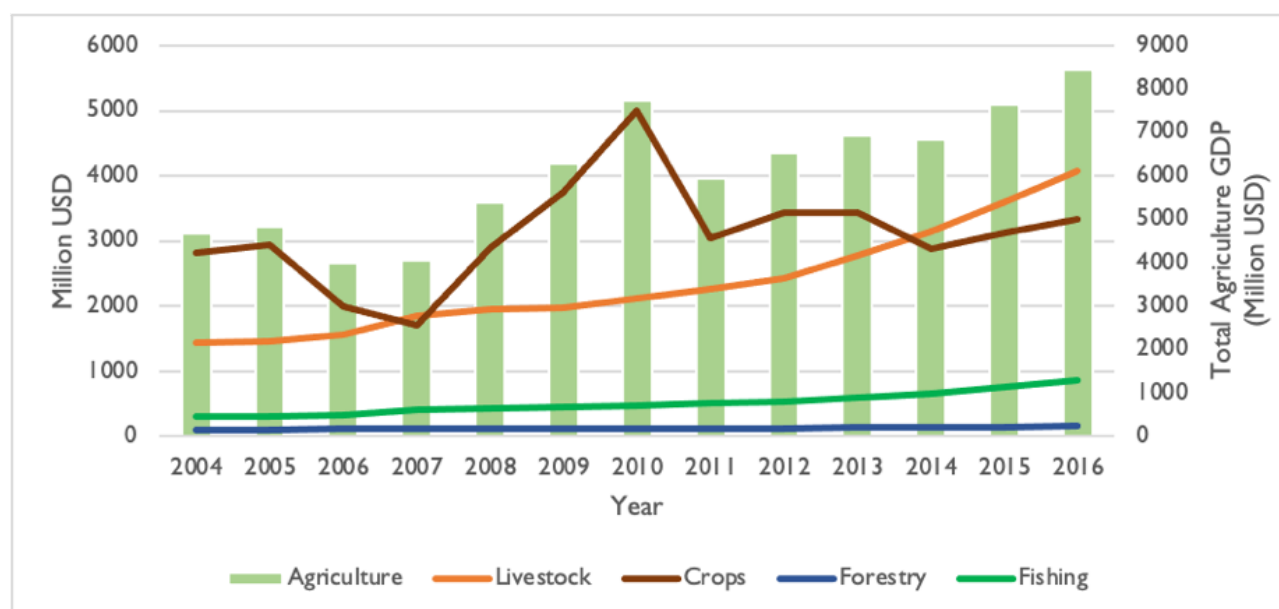
Figure 11. Local production and share of domestic consumption of milk.



The agricultural sector is an important source of employment in the Gambia. Although livestock-specific data are not available, the data from the Gambia Bureau of Statistics indicated that overall, 46% of the working population was engaged in agriculture in the most recent year available (2015/16). The 2018 labour force survey indicates that over 9% of youth were engaged in agriculture, including 7 and 13% of the male and female workforce, respectively.

The values of livestock GDP at current prices together with other agriculture subsectors from 2004 to 2016 indicate that the livestock sector has been an important source of GDP growth (Figure 12). The value of livestock GDP rises steadily from 1.44 to 4.07 million GMD, representing an average annual growth rate of 9%. This growth corresponds to a rise in the share of livestock in agriculture GDP from about 20 to 30%. The increase in value of livestock production is only matched by the relatively small fishing subsector, which rose from 0.3 to 0.9 million GMD during the period. Moreover, it has been observed that the actual contribution of the livestock subsector to the GDP is underestimated because the estimation ignores the values of animal traction, draught power and manure in the calculations (Loum 2019).

Figure 12. Contribution of livestock and other subsectors to agriculture GDP ('000 GMD).



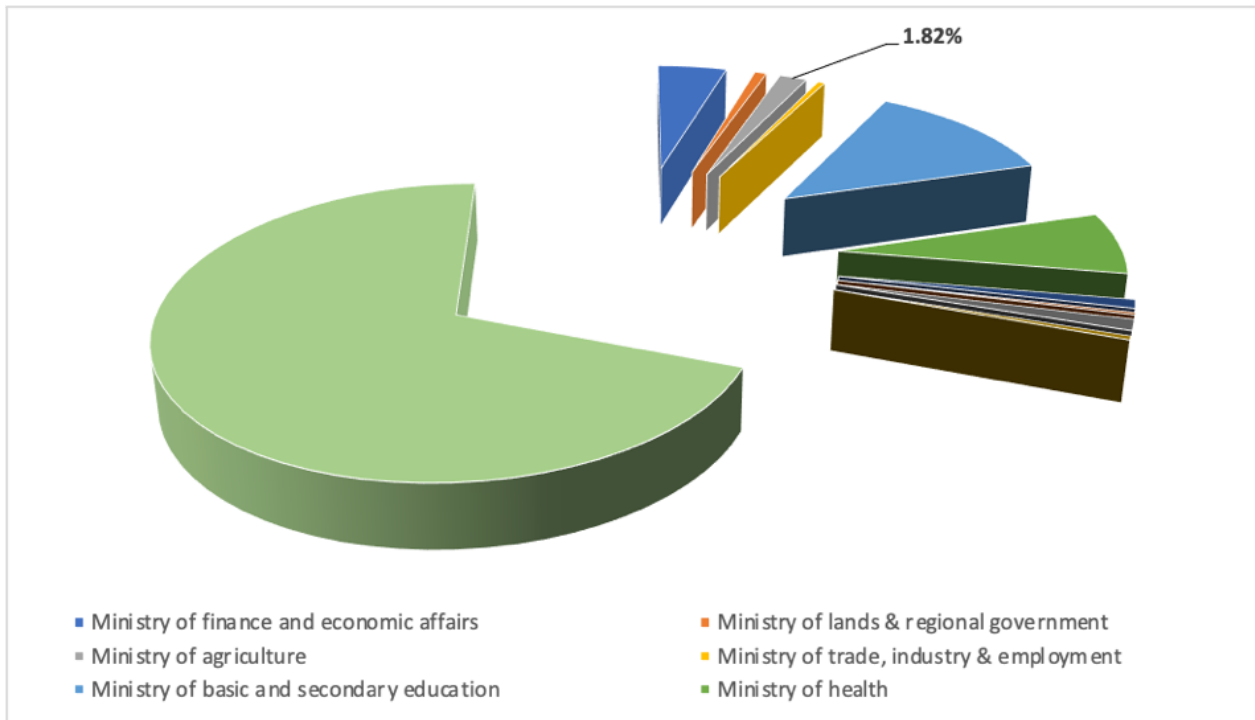
Source: African Development Bank based on GBOS data.

The appropriation¹² of the government of the Gambia for the year 2021 allocated about 2% of the total budget to agriculture (Figure 13) or about GMD 202 million, equal to 3.89 million USD. This is well below the Maputo Declaration, which is remembered mostly for its commitment to allocating at least 10% of national budgetary resources to agriculture to achieve a 6% growth in the agricultural economy. Committing more resources to agriculture is an uphill battle for most of the ministries of agriculture and their treasury or Ministry of finance in Africa.

Similarly, the budget earmarked for the livestock sector for 2021/22 is only 7.2% of the total agricultural budget (Figure 14), which is well below the contribution of livestock to the agricultural gross domestic product (AGDP), ranging from 20 to 30% during 2014–2016 based on the available literature. This suggests the appropriateness of revisiting proposed budgets and targets for livestock production to determine if it is appropriate to align them more with the actual contribution, which can be synthesized based on a detailed quantitative analysis of the potential of the livestock sector to contribute to economic development in the Gambia.

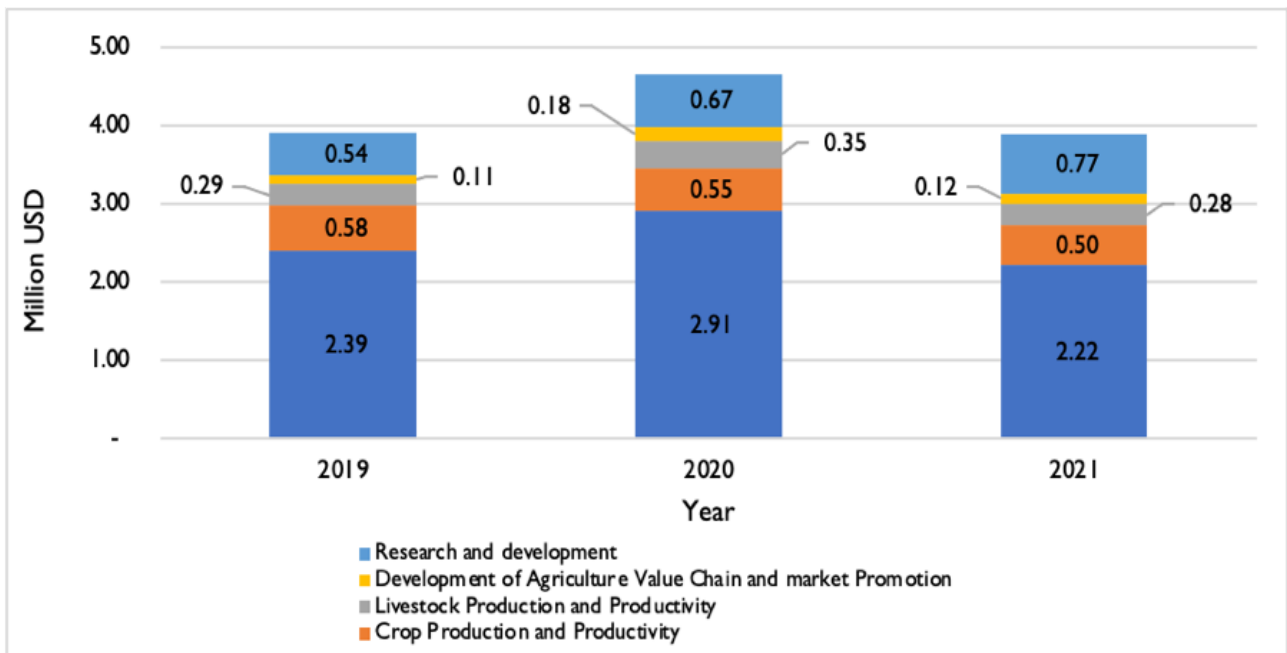
12. Approved-Budget-2021.pdf

Figure 13. Budget appropriation of the government of the Gambia (2021/22).



Source: Government of the Gambia (2021).

Figure 14. Total budget of the ministry of agriculture departments (2019–2021).



Source: Government of the Gambia (2021).

5.2 Current (2020/21) livestock population, production and GDP

5.2.1 Current livestock population

Estimates for the current livestock population in the Gambia were developed based on the growth rates derived from the latest two censuses (1993 and 2016). According to these two censuses, the livestock population in the Gambia has been growing very steadily. See Table 27 below.

The FAO data and other sources are mainly based on sample surveys and projections and show huge fluctuations across different years while the census data are derived from a comprehensive headcount of all the livestock species in the Gambia and relatively are more accurate.

Table 27. Livestock numbers, growth rates and estimated 2020/21 livestock numbers in the Gambia, by species

Livestock species	1993 census	2016 census	Annualized growth rate	Projected 2020/21
Cattle	279,000	292,837	0.2%	296,265
Sheep	116,000	172,662	1.7%	188,256
Goats	214,000	328,336	1.9%	360,357
Chicken	550,000	937,951	2.3%	1,053,356

Source: The Gambia Bureau of Statistics.

Table 28 presents the distribution of livestock over the different production zones, which clearly shows that most of the livestock are found in the Eastern zone. The Eastern zone is home to about 56, 52 and 64% of the total cattle, sheep and goat population in the Gambia, respectively. In contrast, the Western zone hosts a relatively minor livestock population share in all species; cattle about 13%, sheep, 3% and goats 22%.

The commercial livestock production system in the Gambia is at an early stage of development. There are only 331 commercial dairy animals and 221,434 commercial chicken.

Table 28. Estimated current livestock numbers and distribution over the three livestock production zones, base year 2020/21

Production zone	Western	Central	Eastern	Commercial system	Total
Cattle	38,046	91,815	166,073	331	296,265
Sheep	5,812	62,091	120,352		188,256
Goats	77,653	95,230	187,474		360,357
Chicken	1,002,185			221,434	1,223,619

Source: LSA projection from 2016.

5.2.2 Estimates of current livestock production

The Gambia produced about 6.6 thousand tonnes of meat during 2020/21 according to our estimates. Species-wise, most meat production comes from cattle, about 60%, followed by goats, 16% and chicken, 17%. In contrast, the sheep contribute only about 7% of the total meat production of the Gambia. Most of the red meat, more than 56%, is produced in the Eastern production zone, followed by the Central (28.5%), Western (14.8%) and the commercial sector (0.1%) as shown in Table 29.

Table 29. Estimated annual total meat production by production zone, t/year, base year 2020/21

Production zone	Western	Central	Eastern	Commercial system	Total	Per cent share
Cattle meat	526.7	1,257.7	2,270.4	9.8	4,064.6	59.7%
Mutton	80	73.9	341.8		495.7	7.3%
Goat meat	226.4	278.8	599.1		1,104.3	16.2%
Total red meat	833.2	1,610.3	3,211.3	9.8	5,664.6	83.2%
Per cent share of the red meat	14.8%	28.5%	56.6%	0.1%	100%	–
Chicken meat	408.2			738.7	1,146.9	16.8%
				Total meat	6,811.5	100.0%

Source: Baseline analysis.

Cattle provide most of the milk in the Gambia, about 92% of production. Goat milk production is acknowledged to exist but is not usually available in the market. Goats are generally not milked at all in most regions in the Gambia. However, in some parts of CRR and URR, some households milk goats. The volumes produced are insignificant and it is mostly used for domestic consumption.

Livestock production zone wise, the Eastern production zone contributes more than half of the country's total annual milk production (Table 30).

Table 30. Estimated annual milk production by production zone, 000 litres, base year 2020/21

Production zone	Western	Central	Eastern	Commercial system	Total	Per cent share
Cattle	2,562.1	6,353	10,969.6	245.4	20,130.1	92.2%
Goats	342.5	451.4	881.1	0	1,675	7.8%
Total	2,904.5	6,804.4	11,850.7	245.4	21,805	100%
Per cent share	13.2%	31.5%	54.3%	0.9%	100%	

Source: Baseline analysis.

The commercial layer system derives egg production in the Gambia. About 91% of the total egg produced in the country comes from the layer system (Table 31). Though the backyard chicken population is about 82% of the entire chicken population, it only contributes about 9% of the total egg production.

Table 31. Estimated annual egg productions by chicken production systems, base year 2020/21

Production systems	Egg production (in thousands)	Per cent contribution
Backyard chicken	2,371.2	9.4%
Commercial layer chicken	22,876.3	90.6%
Total	25,247.5	100.0%

Source: Baseline analysis.

The other livestock products considered in the analysis include hides and skin, manure and draught power. Although no data indicate quantities of hides and skins, manure and draught power have contributed significantly to the livestock production of the Gambia (Table 32).

Table 32. Estimated current livestock production in the Gambia, base year 2020/21

Livestock product	Production 2020/21
Meat (t)	6,811.5
Cattle meat	4,064.6
Mutton	495.7
Goat meat	1,104.3
Chicken meat	1,146.9
Milk and milk products (thousand litres)	21,805
Egg (in thousands)	25,247.5
Hide and skins (t)	0
Manure (t)	213,231.4
Draught power (thousand days)	5,590.9

Source: Baseline analysis.

5.2.3 Current livestock GDP

The contribution of a livestock sector to the gross domestic product (GDP) remains an essential indicator for decision-makers and donors in their investment decisions. According to the budget appropriation report of the government of the Gambia, the GDP for the year 2021 was about GMD 106.9 billion and the contribution of livestock to the Gambia GDP, reported by the Gambia Data Portal,¹³ was about GMD 3.2 billion. However, the estimate of the livestock contribution to the national economy or the livestock sector GDP for 2021 was about GMD 5.4 billion.

The livestock share of agricultural GDP is often underestimated or poorly estimated. The main reasons for this are the lack of reliable information on the livestock population and incorrect estimates of technical coefficients (offtake rate, productivity etc.) and the difficulties both in evaluating the multitude of animal coproducts, such as manure and draught power and in capturing the enormous diversity of livestock systems and therefore the underlying variability of outputs within each system (Dutilly et al. 2020). The LSIPT uses a 'production approach'¹⁴ that considers monetary and nonmonetary exchanges (home consumption, barter, gifts etc.). The value of these exchanges is often omitted from analyses and is essential in countries where most of the animal population belongs to small-scale farmers and home consumption represents a considerable share of the national production.

Using the LSIPT, the livestock sector GDP for 2021 is about GMD 5.4 billion, which is higher than the official national estimate of about GMD 2.2 billion. The variation arises because the baseline analysis follows the production approach and includes draught power and manure contributions when estimating the livestock GDP.

Table 33. Estimated livestock contribution to the Gambia GDP (in million GMD) by livestock species and product types, base year 2020/21

	Total GDP (in million GMD)					Grand total GDP (in million GMD)	Per cent share of total GDP by species
	Meat	Milk	Eggs	Manure	Draught power		
Cattle	688.8	544.9	–	30.8	3,604	4,868.6	89.8%
Sheep	164.2	–	–	19.5	–	183.7	3.4%
Goats	264.3	–	–	25.1	–	289.4	5.3%
Chicken	56.2	–	19.9	2.3	–	78.4	1.4%
Total	1,173.5	544.9	19.9	77.7	3,604	5,420.0	100.0%

Source: Baseline analysis.

13. National accounts (GDP)—Gambia Data Portal (opendataforafrica.org)?

14. See Dutilly et al. (2020) for more livestock GDP calculation.

The LSIPT GDP estimates disaggregated by species and product are presented in Table 33 above. Cattle, the dominant species in the livestock sector of the Gambia, contributes about 90% to the total livestock GDP, followed by goats (5%) and sheep (3%).

Similar to the livestock production and population, the Eastern production zone contributes the highest to the country's GDP. The Eastern production zone contributes to about half of the total livestock GDP, followed by the Western Zone, which contributes about 28% of the GDP (Table 34). The backyard chicken and commercial production systems currently contribute about 1% to the national livestock GDP.

Table 34. Estimated total GDP by livestock production zones and backyard chicken and commercial production systems, base year 2020/21

Livestock production zones	GDP (in million GMD)	Per cent contribution to the state GDP
Western	1,517.6	28.00%
Central	1,092.4	20.16%
Eastern	2,730.5	50.38%
Backyard chicken	47.4	0.87%
Commercial systems	32.1	0.59%
Total	5,420.0	100.00%

Source: Baseline analysis.

5.3 Projection of livestock populations, production and GDP to 2035/36 under BAU

In the BAU, the current production, reproduction and financial parameter and future population growth trends are assumed to follow the past trends or the existing level of investment for the coming 15 years. The livestock population growth trends were calculated using the last two censuses (1993 and 2016) (Table 27). The following subsections present the changes in population, production and GDP projections under the BAU scenario by the 15th year (2035/36).

5.3.1 Projected livestock population (to 2035/36 BAU)

Projected (2035/36) livestock numbers under the BAU scenario suggest population changes of up to 40% for the sheep, goats and chicken populations (Table 35), by 2035/36. Cattle population growth is projected to be much lower, with a total increase of less than 3%.

Table 35. Comparison of estimated current (2020/21) and projected (2035/36) livestock numbers, by species and breed or ownership category

Species	Breed or herd size or ownership category	Livestock number		Per cent change between 2020/21 and 2035/36	Annualized growth rate
		2020/21	2035/36		
Cattle	N'Dama	289,247.7	297,149	2.7%	0.2%
	Zebu/Gobra	6,687	6,857.9	2.6%	0.2%
	Commercial dairy	330.5	430.6	30.3%	1.8%
	Total	296,265.2	304,437.5	2.8%	0.2%
Sheep	Djallonke	88,475.9	113,930.3	28.8%	1.7%
	Sahelian	6,754.5	7,015.6	3.9%	0.3%
	Female owned (Djallonke)	93,025.6	119,788.9	28.8%	1.7%
	Total	188,256	240,734.8	27.9%	1.7%

Species	Breed or herd size or ownership category	Livestock number		Per cent change between 2020/21 and 2035/36	Annualized growth rate
		2020/21	2035/36		
Goats	Small (1–10)	176,574.8	237,008.2	34.2%	2%
	Female owned	183,781.9	246,682	34.2%	2%
	Total	360,356.7	483,690.1	34.2%	2%
Chicken	Backyard (Female owned)	1,002,185	1,404,581.6	40.2%	2.3%
	Layer	107,681.0	150,917.0	40.2%	2.3%
	Broiler	113,752.9	159,426.9	40.2%	2.3%
	Total	1,223,619.0	1,714,925.5	40.2%	2.3%

Source: Baseline analysis.

5.3.2 Projected livestock production (to 2035/36 under BAU)

Milk production by 2035/36 is expected to grow by 5.5% compared to the base year, whereas meat production will grow by about 14% (Table 36). Egg production, influenced mainly by the population change of layer chicken, is expected to increase by 40% in the coming 15 years.

Table 36. Current and projected production of livestock products in BAU scenario for 2020/21 and 2035/36

Livestock product	Year		Per cent change between 2020/21 and 2035/36
	2020/21	2035/36	
Meat (thousand t)	6,811.5	7,898.7	16%
Cattle	4,064.6	4,178.4	2.8%
Mutton	495.7	630.2	27.2%
Goat meat	1,104.3	1,482.7	34.3%
Chicken meat	1,146.9	1,607.4	40.2%
Milk and milk products (thousand litres)	21,805	23,001.2	5.5%
Cattle	20,130.1	20,752.9	3.1%
Goats	1,675	2,248.4	34.2%
Eggs (in thousands)	25,247.5	35,384.8	40.2%
Hides and skins (in t)	0	0	NAa
Manure (in t)	1,937.7	2,715.6	10.2%
Draught power (thousand days)	5,590.9	5,812.1	40.1%

a. Hides and skins are not used or sold. The prices are negligible.

Source: Baseline analysis.

5.3.3 Projected livestock GDP (to 2035/36 under BAU)

The total value of livestock products is projected to increase by about 7% between 2020/21 and 2035 (Table 37). Chicken eggs show the highest percentage increase in GDP during the 15 years BAU period (about 40%), followed by meat and manure, each contributing about a 16 and 20% increase, respectively.

Table 37. Comparison of livestock GDP base year (2020/21) and 2035/36, million GMD, by livestock product

Livestock productions	GDP (in million GMD)		Per cent change between 2020/21 and 2035/36
	2020/21	2035/36	
Meat	1,173.5	1,356.2	15.6%
Milk	544.9	577.7	6%
Eggs	19.9	27.8	39.7%
Hides and skins	–	–	NAa
Manure	77.6	92.8	19.5%
Draught power	3,604	3,729.5	3.5%
Total	5,420.0	5,784.0	6.7%

a. Hides and skins are not used or sold. The prices are negligible.

Source: Baseline analysis.

The change in the GDP contribution of the different livestock species is aligned with livestock population change (Table 38). Chicken shows the highest increase in GDP contribution, with about 40% change, followed by goats (with 34% increase) and sheep (29% increase). Under the BAU, the contribution of cattle to GDP in 15-years will increase minimally, by about 3.7%. This finding suggests the need to consider additional investments in all livestock subsectors.

Table 38. Comparison of the base year (2020/21) and 2035/36 livestock GDP (in million GMD) by species

Species	Year		Per cent change between 2020/21 and 2035/36
	2020/21	2035/36	
Cattle	4,868.6	5,050	3.7%
Sheep	183.7	236.1	28.5%
Goats	289.4	388.4	34.2%
Chicken	78.5	109.7	40.0%
Total	5,420.1	5,784.2	6.7%

Source: Baseline analysis.

6 Conclusion

This livestock sector analysis (LSA) report analyses the baseline (2020/21) livestock population, production and GDP contributions considering the Gambia livestock production zones, species and subsystems. The assessment establishes the baseline results to carry out the livestock sector strategy (LSS) foresight scenario analysis with confidence that the data and model findings represent the sector's current state.

The finding demonstrates that the estimated baseline population, production and GDP, based on the best available data, relatively compare well with reports from the government of the Gambia and other international and non-governmental organizations.

The LSA classified the Gambia livestock production systems into three livestock production zones, Western, Central and Eastern. In addition to the three geographic production zones, a commercial/specialized livestock production system extends across the production zones. The commercial or specialized production systems include urban and peri-urban dairy and layer and broiler chicken systems. The livestock production zones and the commercial production systems are subdivided into different species, breeds, ownership types and flock/herd size groups. Indicators used to classify traditional ruminant production systems in the Gambia include agro-climate, production scale, genotypes, feeding practices, commercial orientation, women participation, prevailing challenges and opportunities.

The three production zones include the Western, Central and Eastern zones. Western livestock production zone consists of the Western Coastal region and Kanifing Municipal Council; the Central livestock production zone consists of the Lower River Region and the Northern Bank Region; whereas the Eastern livestock production zone consists of the Central River Region (south), the Central River Region (north) and the Upper River Region.

All the three livestock production zones (Western, Central and Eastern) are important for livestock production. However, based on the current technologies and the current level of investment, the Western production zone seems to be more suitable for commercial businesses like commercial dairy. There may also be a potential to expand smallholder and large-scale dairy production in the Western zone, a scenario that will be tested in the next phase or when preparing the livestock sector strategy.

The priority species considered in the Gambia LSA are cattle, sheep, goats and chicken. The species are further classified according to the breed type of cattle size, ownership type (female vs. joint or male) categories in the case of goats and both breed and ownership type in the case of sheep. For backyard chicken, a uniform and women oriented production system is assumed to exist throughout the country.

The 2021 livestock population is estimated based on the 2016 livestock census report and growth rates from the previous census in 1993. According to the estimate, there are about 296,265 cattle, 188,256 sheep, 360,357 goats and 1,053,356 chicken in the Gambia. All the species portray more or less a similar distribution pattern across the three production zones. More than half of the cattle, sheep and goats population are found in the Eastern livestock production zone, whereas the Western production zone has the least number of cattle, sheep and goats.

6.1 The current contribution of livestock in the Gambia

The Gambia is currently estimated to produce about 6.6 thousand t of meat. A significant share of the meat production comes from cattle, about 60%, followed by goats, 16% and chicken, 17%. Sheep contribute only about 7% of the total meat production in the country. In terms of livestock production zones, more than 56% of the red meat is produced in the Eastern production zone, followed by Central (28.5%), Western (14.8%) and the commercial sector (0.1%).

Currently, the Gambia produces about 21.9 million litres of milk. Out of this, about 92% is collected from cattle and 8% from goats. Most of the milk production, about 85%, comes from the Eastern and Central livestock production zones.

The current egg production of the Gambia stands at about 5.3 million eggs and most of it, about 96%, comes from the commercial layer production system. The remaining 4% of egg production comes from the backyard chicken system.

The current estimated contribution of the livestock sector to GDP is about GMD 5.5 billion, which is higher than the current estimate by the government, GMD 3.2 billion. The variation could be because the LSA follows the production approach and considers the monetary value of the direct and indirect contribution of the livestock sector, such as draught power and manure contributions when estimating the livestock GDP.

6.2 15-year projection with the BAU scenario

A BAU scenario is analysed, assuming that a BAU investment trend will continue for the coming 15 years. By 2035/36, the sheep, goats and chicken numbers are projected to increase by 28, 34 and 40%, respectively, whereas the cattle population will increase by 3% only. These imply annual growth rates for cattle, sheep, goats and chicken of 0.2, 1.7, 2 and 2.3%, respectively.

It is expected that, under the BAU scenario, milk and meat production are projected to grow by 5.5 and 15%, respectively, in the coming 15 years. At the same time, egg production will increase significantly by 40%.

Under the BAU scenario, (between 2020/21 and 2035/36), the total livestock products contribution to the GDP is projected to increase only by about 7%. The most significant increase in GDP contribution will be from eggs (about 40%), followed by meat and manure, each with about an 18% increase. In terms of species, the highest increase in GDP contribution will come from chicken, with about 39% change, followed by goats (with 34% increase) and sheep (28% increase). If the current level of investment continues, the contribution of cattle to the GDP will stay minimal.

The changes projected for the livestock production and GDP under the BAU scenario for beef and dairy are very marginal. The production changes and GDP contribution of the small ruminants and poultry subsectors are modest but may not meet future consumption requirements of the country, urging additional investments in areas of animal health, feed, breeding and marketing to revive the livestock sector of the Gambia. This will be further confirmed in the next deliverable, the 15-year livestock sector strategy, which analyses the future production–consumption gaps, areas of improvement or interventions and their likely costs and impacts.

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Annexes

Annexe I. Production and reproduction parameter

Table 39. Cattle production and reproduction parameter

Cattle parameter	Production zones/systems							
	Western		Central		Eastern		Urban and peri-urban dairy	
	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	Small	
I. Age classes length (months)								
Female	Calf	12	12	12	12	12	12	12
	Subadult	36	30	36	36	36	30	18
	Adult	96	90	96	92	96	96	65
Male	Calf	12	12	12	12	12	12	12
	Subadult	24	30	24	36	24	30	6
	Adult	24	34	24	104	24	96	30
II. Demography								
Reproduction								
	Parturition rate/year	0.48	0.52	0.49	0.51	0.49	0.52	0.70
	Rate of net prolificacy	1	1	1	1	1	1	1
	% of females at birth	50%	50%	50%	50%	50%	50%	50%
Mortality (%)								
Female	Calf	16%	22%	16%	25%	17%	25%	10%
	Subadult	6%	8%	6%	7%	6%	8%	5%
	Adult	3%	5%	3%	4%	3%	6%	3%
Male	Calf	16%	22%	16%	25%	17%	25%	10%
	Subadult	6%	8%	6%	7%	6%	8%	5%
	Adult	3%	5%	3%	5%	3%	6%	3%
Offtake (%)								
Female	Calf	0%	0%	0%	0%	0%	0%	1%
	Subadult	2%	0%	2%	0%	2%	0%	3%
	Adult	3%	0%	3%	0%	3%	0%	8%

Cattle parameter	Production zones/systems							
	Western		Central		Eastern		Urban and peri-urban dairy	
	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	Small	
Male	Calf	10%	0%	12%	0%	8%	0%	30%
	Subadult	15%	0%	20%	0%	10%	0%	60%
	Adult	25%	0%	30%	0%	20%	0%	10%
III. Production								
Live weight (kg/ animal)								
Female	Calf	59	77	50	65	50	65	50
	Subadult	155	200	150	195	150	195	120
	Adult	225	293	215	270	208	280	250
Male	Calf	62	81	52	68	52	68	65
	Subadult	158	205	156	200	156	200	120
	Adult	300	390	295	380	295	380	300
Meat								
	Dressing percentage (%)	47%	50%	47%	50%	47%	50%	50%
Financial price of offtake/ animal								
Female	Calf	6,000	10,000	5,000	8,000	5,000	8,000	10,000
	Subadult	20,000	33,000	18,000	30,000	18,000	30,000	33,000
	Adult	20,000	33,000	18,000	30,000	18,000	30,000	33,000
Male	Calf	7,000	12,000	6,000	10,000	6,000	10,000	12,000
	Subadult	25,000	42,000	22,000	33,000	20,000	37,000	42,000
	Adult	35,000	58,000	30,000	47,000	28,000	50,000	58,000
Milk (litre)								
	Length of milking period (days)	305	305	305	305	305	305	300
	Milking quantity per day (litre/cow)	1.1	2.2	1.1	2.2	1.1	2.2	8
	Production (litres)	335.5	671	335.5	671	335.5	671	2400

Table 40. Goat production and reproduction parameter

Goat parameter	Production zones/subsystems						
	Western		Central		Eastern		
	Small (1-10)	Female owned	Small (1-10)	Female owned	Small (1-10)	Female owned	
I. Age classes length (months)							
Female	Kid	6	6	6	6	6	6
	Subadult	10	10	10	10	10	10
	Adult	56	56	56	56	56	56
Male	Kid	6	6	6	6	6	6
	Subadult	9	9	9	9	9	9
	Adult	18	18	18	18	18	18
II. Demography							
Reproduction							
	Parturition rate/year	1.25	1.25	1.25	1.25	1.25	1.25
	Rate of net prolificacy	1.25	1.25	1.25	1.25	1.25	1.25
	% of females at birth	50%	50%	50%	50%	50%	50%
Mortality (%)							
Female	Kid	40%	40%	43%	43%	42%	42%
	Subadult	15%	15%	15%	15%	16%	16%
	Adult	9%	9%	9%	9%	6%	6%
Male	Kid	40%	3%	43%	42%	42%	
	Subadult	15%	15%	15%	15%	16%	16%
	Adult	9%	9%	9%	9%	6%	6%
Offtake (%)							
Female	Kid	2%	2%	2%	2%	2%	2%
	Subadult	5%	5%	5%	5%	5%	5%
	Adult	11%	11%	9%	9%	12%	12%
Male	Kid	15%	15%	16%	16%	15%	15%
	Subadult	40%	40%	60%	60%	60%	60%
	Adult	65%	65%	90%	90%	90%	90%
III. Production							
Live weight kg/animal							
Female	Kid	5	5	5	5	5	5
	Subadult	10	10	10	10	10	10
	Adult	25	25	25	25	25	25
Male	Kid	6	6	6	6	6	6
	Subadult	12	12	12	12	12	12
	Adult	20	20	20	20	20	20
Meat							
	Dressing percentage (%)	55%	55%	55%	55%	55%	55%

Goat parameter	Production zones/subsystems						
	Western		Central		Eastern		
	Small (1-10)	Female owned	Small (1-10)	Female owned	Small (1-10)	Female owned	
Financial price of offtake/animal							
Female	Kid	2,500	2,500	1,700	1,700	2,500	2,500
	Subadult	3,000	3,000	2,500	2,500	3,000	3,000
	Adult	3,000	3,000	3,000	3,000	3,000	3,000
Male	Kid	2,000	2,000	2,000	2,000	2,000	2,000
	Subadult	2,500	2,500	2,500	2,500	2,500	2,500
	Adult	3,500	3,500	3,500	3,500	3,500	3,500
Milk (litre)							
	Length of milking period (days)	127	127	127	127	127	127
	Milking quantity/day per litre per reproductive female	0.1	0.1	0.1	0.1	0.1	0.1
	Production (litres)	8.23	8.23	8.23	8.23	8.23	

Sheep parameter	Production zones/subsystems									
	Western			Central			Eastern			
	Djallonke	Sahelian	Female owned (Djallonke)	Djallonke	Sahelian	Female owned (Djallonke)	Djallonke	Sahelian	Female owned (Djallonke)	
Female	Lamb	3,500	5,000	3,500	3,000	4,000	3,000	2,800	4,000	2,800
	Subadult	5,500	6,500	5,500	5,000	6,000	5,000	4,800	6,000	4,800
	Adult	6,500	7,000	6,500	6,000	6,000	6,000	5,800	6,000	5,800
Male	Lamb	3,500	5,000	3,500	3,000	4,000	3,000	2,800	4,000	2,800
	Subadult	5,500	7,500	5,500	5,000	6,000	5,000	4,800	6,000	4,800
	Adult	6,500	12,000	6,500	6,000	10,000	6,000	5,800	10,000	5,800

Table 42. Cattle financial parameter

Cattle parameter	Units		Production zones/systems						
	Western		Central		Eastern		Urban and peri-urban dairy		
	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	Small		
I. Production costs and general expenses									
Cost of feed									
Digestible dry matter (DDM)	% of feed purchased	%	0%	0%	0%	0%	0%	0%	100%
Concentrates									
	Female-Adult (F-A)	kg/day	0	0	0	0	0	0	3
	Subadult	kg/day	0	0	0	0	0	0	0
	Calf	kg/day	0	0	0	0	0	0	0
	Male	kg/day	0	0.38	0	0.38	0	0.38	0.38
Additives		kg/day	0	0	0	0	0	0	0
Salts and minerals		kg/day	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Production costs for forage									
Forage production	Area	ha	0	0	0	0	0	0	0
Consumables and small equipment									
	Veterinary costs and medicines	cost/animal	600	1,200	500	1,000	500	1,000	2,400
	Artificial insemination	cost/cow	60	60	0	0	0	0	3,000
	Herder	months/year	666	666	1,776	1,110	1,110	1,110	4,000
	Salaried labour	days/year	79.25	79.25	79.25	79.25	79.25	79.25	250
	Other (water, maintenance, transport)	cost/year	0.42	0.42	0.42	0.42	0.42	0.42	1,000
Family labour									
	Family labour	people/year	0.5	0.5	0.5	0.5	0.5	0.5	1
Cost of loan for working capital									
% of production costs and general expenses financed by a loan		%	0%	0%	0%	0%	0%	0%	0%
II. Products Unit									
Valuation of animal products	Meat	kg	234.59	270.76	214.54	236.16	202.53	242.45	276.82
	Milk	litre	60	60	30	30	30	30	60
	Hides and skins	kg	41.67	53.85	25	30.77	25	30.77	53.85
	Wool	Kg	0	0	0	0	0	0	0
	Organic matter	Kg	1.5	1.5	0	0	0	0	1.5
	Animal draught	Pair/day per year	1,750	1,750	500	500	500	500	

Cattle parameter	Units		Production zones/systems						
	Western		Central		Eastern		Urban and peri-urban dairy		
	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	Small		
Draught power									
	Number of draught animals in the herd	No.	3.5	0.9	3.1	1.8	3.9	1.8	0
	Number of days of animal traction per year	No.	70	70	70	70	70	70	0
Type of exchanges									
Household consumption									
	Meat	%	0%	0%	0%	0%	0%	0%	0%
	Milk	%	12%	12%	16%	54%	54%	16%	0%
	Hides and skins	%	0%	0%	0%	0%	0%	0%	0%
	Organic matter	%	40%	40%	40%	40%	40%	40%	5%
	Animal draught	%	80%	80%	80%	80%	80%	80%	0%
Structure of production costs and general expenses	Salaried labour	%	12.9%	40%	27.9%	49%	21.9%	49.1%	3.8%
	Feeds	%	42.1%	27.2%	38.8%	30.3%	42.1%	30.3%	89.2%
	Veterinary costs + artificial insemination	%	45%	32.8%	33.3%	20.6%	36%	20.6%	6.6%
	Other (water + taxes)	%	0%	0%	0%	0%	0%	0%	0.3%
Product structure	Meat	%	36.5%	27.1%	53.9%	30.8%	51.6%	31.1%	14%
	Milk	%	44.3%	48.2%	38.5%	39.9%	37.3%	41%	77.3%
	Hides and skins	%	0%	0.5%	0%	0.4%	0%	0.4%	0.3%
	Wool	%	0%	0%	0%	0%	0%	0%	0%
	Organic matter	%	0%	0%	0%	0%	0%	0%	8.4%
	Draught power	%	19.2%	24.1%	7.6%	29%	11.1%	27.4%	0%
Intermediate costs									
	Intermediate cost/animal used	In GMD	9,182	25,031	7,977	41,933	8,544	41,425	228,009
	% of the intermediate cost per animal	%	13.48%	14.43%	20.28%	33.98%	20.6%	32.25%	93.39%
	% of the intermediate cost per litre of milk	%	13.48%	14.43%	20.28%	33.98%	20.6%	32.25%	93.39%
	% of intermediate cost of draught per hour of traction	%	13.48%	14.43%	20.28%	33.98%	20.6%	32.25%	0%

Cattle parameter		Units		Production zones/systems				Urban and peri-urban dairy	
		Western		Central		Eastern		Small	
		N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra	N'Dama	Zebu/Gobra		
Income and profit									
	Net income from animal production (gross margin)	In GMD	380,191	71,126	206,895	14,739	183,057	17,191	131,934
	Net income per animal	In GMD	7,599	11,840	3,897	2,455	3,893	2,863	2,012
	Net income per cow	In GMD	18,489	33,196	9,345	8,702	9,778	9,547	4,554
	Profit margin (net income/product)	%	84.6%	76.1%	72.2%	33.6%	73.7%	37.2%	3.5%
	Net income from animal production after financing the loan for working capital	In GMD	380,191	71,126	206,895	14,739	183,057	17,191	131,934
	Total net income after financing the loan for working capital	In GMD	380,191	71,126	206,895	14,739	183,057	17,191	131,934

Goat parameter		Units		Production zones/subsystems					
		Western		Central		Eastern			
		Small (1-10)	Female owned	Small (1-10)	Female owned	Small (1-10)	Female owned		
	Milk	%	100%	100%	100%	100%	100%	100%	100%
	Hides and skins	%	0%	0%	0%	0%	0%	0%	0%
	Wool	%	0%	0%	0%	0%	0%	0%	0%
	Organic matter	%	50%	50%	90%	90%	90%	90%	90%
Intermediate costs									
	Intermediate cost/ animal used	In GMD	637	637	603	603	578	578	
	% of the intermediate cost per animal	%	19.08%	19.08%	22.3%	22.3%	21%	21%	
	% of the intermediate cost per litre of milk	%							
	% of intermediate cost of draught per hour of traction	%	0%	0%	0%	0%	0%	0%	0%
Structure of production costs and general expenses (%)	Salaried labour	%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%
	Feeds	%	0%	0%	0%	0%	0%	0%	0%
	Veterinary costs + artificial insemination	%	67.6%	67.6%	67.6%	67.6%	67.6%	67.6%	67.6%
	Other (water + taxes)	%	2%	2%	2%	2%	2%	2%	2%
Product structure	Meat	%	84.9%	84.9%	100%	100%	100%	100%	100%
	Milk	%	0%	0%	0%	0%	0%	0%	0%
	Hides and skins	%	0%	0%	0%	0%	0%	0%	0%
	Wool	%	0%	0%	0%	0%	0%	0%	0%
	Manure	%	15%	15%	0%	0%	0%	0%	0%
	Animal draught	%	0%	0%	0%	0%	0%	0%	0%
Income and profit									
	Net income from animal production (gross margin)	In GMD	4,070	4,070	3,280	3,280	3,598	3,598	
	Net income per animal	In GMD	806	806	650	650	712	712	
	Net income per cow	In GMD	1,829	1,829	1,371	1,371	1,514	1,514	
	Profit margin (net income/product)	%	73.2%	73.2%	68.7%	68.7%	70.7%	70.7%	
	Net income from animal production after financing the loan for working capital	In GMD	4,070	4,070	3,280	3,280	3,598	3,598	
	Total net income after financing the loan for working capital	In GMD	4,070	4,070	3,280	3,280	3,598	3,598	

Sheep parameter		Units		Production zones/subsystems							
		Western			Central			Eastern			
		Djall-onke	Sahe-lian	Female owned (Djallonke)	Djall-onke	Sahe-lian	Female owned (Djallonke)	Djall-onke	Sahe-lian	Female owned (Djallonke)	
II. Products											
Valuation of animal products	Meat	Kg	447.6	507.5	447.6	432.3	421.3	432.3	395.5	440.4	395.5
	Milk	Litre	0	0	0	0	0	0	0	0	0
	Hides and skins	Kg	12.5	16.7	12.5	12.5	12.5	12.5	12.5	12.5	12.5
	Wool	Kg	0	0	0	0	0	0	0	0	0
	Organic matter	Kg	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Type of exchanges											
Household consumption			10%	10%	10%	10%	10%	10%	10%	10%	10%
	Meat	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Milk	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Hides and skins	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Wool	%	50%	50%	50%	90%	90%	90%	90%	90%	90%
	Organic matter	%									
Intermediate costs			989	7,159	989	954	5,585	954	876	3,191	876
	Intermediate cost/animal used	GMD	14.92%	80.4%	14.92%	17.85%	75.51%	17.85%	15.92%	49.34%	15.92%
	% intermediate cost/animal	%									
	% intermediate cost/litre of milk	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	% intermediate cost of draught/hour of traction	%									
Structure of production costs and general expenses (%)	Salaried labour	%	26.9%	0.2%	26.9%	35%	9.3%	35%	33.5%	9.6%	33.5%
	Feeds	%	6.8%	74.8%	6.8%	1.7%	44.5%	1.7%	5.9%	42.6%	5.9%
	Veterinary costs + artificial insemination	%	44.9%	13.9%	44.9%	42.9%	22.6%	42.9%	41%	23.4%	41%
	Other (water + taxes)	%	21.4%	11.1%	21.4%	20.4%	23.5%	20.4%	19.5%	24.3%	19.5%
Product structure	Meat	%	92.4%	96.7%	92.4%	100%	100%	100%	100%	100%	100%
	Milk	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Hides and skins	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Wool	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Organic matter	%	7.6%	3.3%	7.6%	0%	0%	0%	0%	0%	0%

Sheep parameter	Units			Production zones/subsystems							
	Western			Central			Eastern				
	Djall-onke	Sahe-lian	Female owned (Djallonke)	Djall-onke	Sahe-lian	Female owned (Djallonke)	Djall-onke	Sahe-lian	Female owned (Djallonke)		
	Animal draught	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Income and profit			4,652	5,866	4,652	3,074	985	3,074	4,017	4,681	4,017
	Net income from animal production (gross margin)	GMD	18,608	15,644	18,608	12,295	3,942	12,295	16,068	18,722	16,068
	Net income per animal	GMD	923	451	923	610	197	610	797	935	797
	Net income per cow	GMD	2,224	1,143	2,224	1,186	442	1,186	1,945	1,975	1,945
	Profit margin (net income/product)	%		17.3%	73.4%	63.5%	12.9%	63.5%	68.6%	42.2%	68.6%
	Net income from animal production after financing the loan for working capital	GMD	4,652	5,866	4,652	3,074	985	3,074	4,017	4,681	4,017
	Total net income after financing the loan for working capital	GMD	4,652	5,866	4,652	3,074	985	3,074	4,017	4,681	4,017

Table 45. Backyard chicken financial parameter

Backyard chicken parameter	Unit	Number of units
Products and their prices		
Eggs	No.	5
Chicken	Heads	300
Culled hens	Heads	350
Culled cocks	Heads	450
Manure	Kg/year	1.3
Results flock level		
I. Production costs and general expenses of the flock		
Cost of feed		
Total feed costs	GMD	875
Purchase of animals		
Total cost of purchasing animals	GMD	113
Consumables and small equipment		
Vaccines		0
Costs of maintaining investments		300
Total cost of consumables and small equipment	GMD	300
Salaried labour		
Total salary costs	GMD	0
Taxes and contributions		
Total taxes and contributions	GMD	0
Total production costs and general expenses		1,288
II. Income		
Total revenues		2,568
III. Income and other financial indicators		
Net income from animal production	GMD	1,280
Profit margin (net income/product)	%	99.4%
Net income per hen	GMD	581.8
Other indicators		
Structure of production costs and general expenses (%)	%	
Salaried labour		0%
Feeds		67.9%
Purchase of animals		8.7%
Veterinary costs		0%
Costs of maintaining investments and small equipment		23.3%
Taxes and contributions		0%
Product structure (%)	%	
Eggs		12.85%
Chicken		73.4%
Culled hens and cocks		13.69%
Manure		0.05%
Unit margin per egg		
Production cost	GMD	0.2
Sale price	GMD	10
Gross unitary benefit	GMD	9.8

Backyard chicken parameter	Unit	Number of units
Profit rate (gross benefit/production cost)	%	4324.2%
Unit margin per carcass		
Production cost	GMD	33.2
Sale price	GMD	410.6
Gross unitary benefit	GMD	377.4
Profit rate (gross benefit/production cost)	%	1137.1%

Annexe II. Supporting Section 4: Priority institutional and policy constraints and opportunities

Table 46. Priority institutional and policy constraints and opportunities

Policies		Strategies	Constraints	Opportunities
<p>Policy statement 1: Transform the livestock subsector from predominantly traditional low-input low-output production systems to a competitive, commercial, value chain based and private sector led subsector</p>	<p>SPCR: The policy and legislative framework of the Gambia requires significant updating, to fully incorporate and guide responses to current and future enforcement of policies and legislation including climate risks</p>	<p>The low rate of performance of the sector vis-à-vis population growth has resulted in a remarkable deterioration of policy objectives weak capacity to plan and oversee implementation, high fragmentation of mandates, weak coordinating structures and weak knowledge management (GoG/UNDP 2015)</p>	<p>Appropriate policies and strategies to ensure the growth of the subsector thereby contributing to the enhancement of food and nutrition security, participation of the private sector and creation of employment opportunities</p>	
<ul style="list-style-type: none"> • Policy objectives: • To transform the livestock subsector to enhance its contribution to the national economy. To increase, on a sustainable basis, production and productivity for enhanced food and nutrition security 	<p>SPCR The NAP stocktaking report (2015) noted significant gaps with respect to climate change coordination: outdated policies, gaps in knowledge and weak mainstreaming into line ministry spending plans</p>	<ul style="list-style-type: none"> • Low productivity leading to importing live animals, processed chicken and chicken parts, eggs and dairy products to meet the growing demand. The low productivity is due to several challenges • SPCR temperature and moisture effects under a changing climate will likely reduce nitrogen uptake in the rangelands, reducing vegetation palatability in addition, an increased spread of animal diseases is expected, linked to climate induced effects on disease transmission ecology and dynamics 	<ul style="list-style-type: none"> • To enhance private sector participation and investment in the livestock subsector • To contribute to employment generation and household income, particularly for youth and women • Clarification of roles, responsibilities and relationships between different institutions, to reduce duplication of efforts and conflicting mandates 	

Policies	Strategies	Constraints	Opportunities
<p>Cattle:</p>	<p>Promote the sustainable use of N'Dama cattle and facilitate their conservation, breeding and multiplication through private and public/private partnerships</p>		
<p>Small ruminants</p>	<ul style="list-style-type: none"> Promote the sustainable use of Djallonke and West African Dwarf goats Strengthen the adoption of productivity enhancing technologies, including climate change adaptation measures, through the use of the agropastoral farmer field school approach 	<p>Promote the sustainable use of Djallonke and West African Dwarf goats and facilitate them</p>	<p>Conservation, breeding and multiplication through private and public/private partnerships and promote the establishment of exotic sheep and goat breeding farms</p>
<p>Poultry production systems</p>		<ul style="list-style-type: none"> Support the traditional village poultry production systems through the promotion of improved management practices (biosecurity measures, disease control, housing, supplementary feeding etc.) Develop input and output markets to increase the sale and consumption of poultry products, but also create employment for women and young people Provide technical training (housing, feeding, health and general management) to enhance the capacity of the producers Promote contract farming and out grower schemes in broiler and layer production for rapid transformation of the poultry value chain, led by the private sector Facilitate the engagement of the private sector along the entire poultry value chain, particularly in the hatchery industry, breeding, feed mills, cold storage, processing and product development 	

Policies	Strategies	Constraints	Opportunities
Apiculture		<ul style="list-style-type: none"> Promote the use of suitable and standard/modern beekeeping materials Strengthen private sector investors through promoting market linkages and increasing access to finance and modern production and processing methods Enhance the support systems of the honey value chain actors Enhance the capacity of DLS and other service providers to provide adequate extension services and guidelines for beekeepers, processors and traders 	
Other short cycle species		<ul style="list-style-type: none"> Identify and disseminate appropriate and affordable technologies for increased production of ducks, turkeys, guinea fowls and rabbits Provide technical training (housing, feeding, health and general management) for producers to increase production for income generation 	
Policy statement 2: Diversify the livestock feed base to enhance the availability and access to quality feeds	<ul style="list-style-type: none"> Policy objectives: <ul style="list-style-type: none"> To increase production and availability of high quality feeds and forages To identify feed innovations, including forages, to enhance year round access to quality feed To increase, on a sustainable basis, livestock production and productivity for enhanced food and nutrition security 	<ul style="list-style-type: none"> Strategies: <ul style="list-style-type: none"> Assess availability and use of livestock feed resources using the Feed Assessment Tool, Techfest approach, with the potential to mitigate feed constraints during the whole year Promote crop residue (including rice straw) Demarcate and secure grazing areas, including stock routes Develop local conventions tool for managing range resources Promote the production of climate resilient forages (planting high productivity, drought tolerant and deeper rooted fodder grasses and/or legumes) to improve livestock productivity Conduct research to identify locally available feed resources for the formulation of least cost rations for enhanced livestock production and productivity Facilitate private sector investment in sustainable livestock feed production and distribution Develop standards and codes of practice for feeds, raw materials and feed ingredients and promote their adoption and application by livestock producers Create public awareness on feeds and feed ingredient standards Develop human capacity in animal nutrition, in the public and private sectors 	

Policies	Strategies	Constraints	Opportunities
<p>Policy statement 3: Improve animal health and reduce the impact of animal diseases on livestock production, productivity, welfare and public health</p>	<ul style="list-style-type: none"> • Policy objective(s): • To develop a national framework for a sustainable animal health delivery system that meets global standards • To promote animal health by preventing/reducing the incidence of animal diseases, thus protecting the livestock assets of the farming community and improving food security, public health and food safety 	<ul style="list-style-type: none"> • Strategies: • Support the strengthening and continuous review and updating of animal health and welfare legal and regulatory frameworks, including emerging animal health issues • Support the development and strengthening of institutional structures (public, private) for animal health • Develop human resources to fill the acute shortage of veterinarians and laboratory scientists and technicians • Strengthen the epidemic surveillance system and establish an early warning system and emergency preparedness plan • Build capacity of community based sanitary defence committees for greater efficiency and functionality • Enhance capacities and programs to prevent, detect and control zoonosis, emerging and re-emerging diseases • Strengthen food safety control systems for foods of animal origin and feeds • Promote and implement the one health approach • Develop modules to attract private sector involvement in animal health service delivery, including veterinary drugs distribution and other innovations • Government to adopt and ensure the implementation of the strategic frameworks developed by the African Union–Inter African Bureau for Animal Resources (AU–IBAR) namely, animal health strategy for Africa, reprofiling the veterinary profession (Day 1 competencies for veterinarians), training content for newly appointed chief veterinary officers (CVOs)—Day 100 competencies for CVO • Strengthen the capacity of veterinary laboratories to offer disease diagnostic services • Promote/create awareness on animal welfare issues at every stage of the value chain, including production, transportation, slaughter, care of draught animals and animal handling 	<p>The high prevalence of diseases in the country presents a big challenge to the livestock subsector. Animal diseases cause major economic losses through mortality and morbidity, reduced productivity, lowered fertility, unsafe products and restricted access to potential markets. Diseases and disease causing agents such as parasites also limit the animal’s ability to express its genetic potential. One of the main challenges facing the control of animal diseases is the inadequate capacity for sustained disease surveillance, risk assessment and control programs. There is a lot of crossborder movement of animals to traditional seasonal grazing grounds and for trade. Poor coordination and collaboration with neighbouring Senegal on disease control across the border make control of transboundary diseases (TADS) a major challenge. The performance of veterinary services (OIE PVS) evaluation and Gap Analysis of the Gambian veterinary services conducted by the OIE in 2009 and 2012, respectively identified the institutional, technical and other strategic issues affecting the delivery of veterinary services</p>

Policies	Strategies	Constraints	Opportunities
<p>Policy statement 4: Improve value addition, marketing of livestock and livestock products</p>	<ul style="list-style-type: none"> • Policy objectives: <ul style="list-style-type: none"> • To enhance value addition to increase the competitiveness of livestock products • To create an environment to attract private sector investment 	<ul style="list-style-type: none"> • Strategies: <ul style="list-style-type: none"> • Promote the livestock sector value chain approach • Promote commercialization through support for value addition • Promote livestock processing cottage industries in the rural areas • Promote contract farming and outgrower schemes to facilitate market access • Facilitate the provision of livestock market information and support services • Promote private sector involvement in the provision of livestock marketing service • Create awareness of market opportunities and provide incentives for young entrepreneurs to engage in market oriented enterprises to enhance commercialization • Develop quality standards for livestock products and enforce them through legislation • Invest in improved market infrastructure through public–private partnerships • Support a feasibility study to build a pig abattoir to promote better waste management and improve public health • Create awareness among meat and milk processors and retailers on the need for best practices in their operations; and • Build capacity in processing and value addition 	<p>Livestock products are highly perishable; they thus require highly efficient marketing and processing along their entire value chains—from production to consumption—to realize their best value. Value addition in the livestock value chains is constrained by inadequate knowledge and skills, inadequate slaughtering and processing facilities, unaffordable/expensive packaging materials and limited access to financial and business development services. The marketing of live animals remains largely traditional and the marketing infrastructure is generally poor</p>

Policies	Strategies	Constraints	Opportunities
<p>Policy statement 5: Strengthen livestock research and extension and access to credit and inputs</p>	<ul style="list-style-type: none"> • Policy objective: • To support livestock research and extension services to facilitate innovation and adoption of appropriate technologies • To build institutional capacity for effective delivery of livestock research and extension services • To improve access to services, credit and inputs 	<ul style="list-style-type: none"> • Strengthen the adoption of productivity enhancing technologies, including climate change adaptation measures, through the use of the agropastoral farmer field school approach • Build the capacity of extension staff on appropriate extension approaches and methods • Adopt a market oriented livestock extension services approach that promotes commercialization • Support research efforts in animal production, including breeding • Promote research, extension and farmer linkages and collaboration • Promote pluralism in livestock extension service delivery • Promote public-private partnerships enabling private sector participation in the provision of inputs • Create enabling policy environment and incentives to reduce the cost of credit, inputs and services 	<p>Livestock research and provision of support services such as extension, credit, production inputs other technologies are among the tools needed to transform the livestock subsector to attain food security and reduce poverty, through modernization, intensification, diversification and commercialization. However, the current capacity of the national agricultural research institute (NARI) and WALIC, the principal centres that conduct livestock research in the Gambia, are inadequate to bring about the anticipated transformation of the livestock subsector. Furthermore, the DLS (responsible for livestock extension) is constrained by inadequately qualified staff, insufficient funding, low motivation and a lack of guidelines for the delivery of extension services</p>

Policies	Strategies	Constraints	Opportunities
<p>Gender empowerment and mainstreaming policy</p>	<ul style="list-style-type: none"> • Land tenure • There would be a thorough review of the land tenure system in the Gambia taking into consideration all the past studies on the tenure system • Legislation would be enforced to avail women of full ownership of land, particularly land for development purposes. This will also enable them to use such land as collateral to secure loans from banks • The need to synchronize the various land tenure systems to address development needs regardless of gender is paramount to the economic use of resources and does not conflict with social justice 	<p>SPCR: Women: the education policy has drawn attention to the gender imbalance in education and the importance of working towards gender equity. The Women's Act of 2010 addresses the legal provisions for the advancement of the Gambian women, including enforcement of the UN Convention on the Elimination of all forms of Discrimination against Women (CEDAW), the African Charter on Human and Peoples' Right on the Rights of Women in Africa. The Act further makes special provisions regarding the rights of women in rural communities, including the rights of women to have access to agricultural credit and loans, marketing facilities, appropriate technology and equal treatment in land and agrarian reform, as well as inland resettlement schemes. (Section 33.2.e)</p>	<p>The problems faced by women and youth in agricultural production are immense and include limited access to land, credit, appropriate technologies, training and marketing. In the light of these constraints and consistent with the national commitments under the CEDAW, the gender mainstreaming policy strand will emphasize the following policy threads:</p>

Policies	Strategies	Constraints	Opportunities
<p>Access to credit</p> <ul style="list-style-type: none"> Organize female farmers into group savings and credit societies for them to be safe periodically and establish their revolving funds. Establish a rural credit fund for agriculture targeting women and youth small farmers NGOs would be encouraged to assist female farmers with revolving loans to enable them to purchase farm inputs (fertilizers, seeds and farm implements). Repayment could be done after harvest. The government would consider the support and granting subsidy to GWFA and WISDOM (being exclusively women NGOs) for this purpose Revisit the interest rate on the commercial bank loans and set up a minimum interest rate for the poorest farmers particularly the women. This scheme would address the following areas: Increase women's financial strength to purchase more animals with feed, vaccines etc. for a more viable livestock project 			

Policies	Strategies	Constraints	Opportunities
<ul style="list-style-type: none"> • Financially empower women to purchase seeds and farm implements for both food and cash crop production • Support women in the fishing industry to bargain and purchase adequate fish for both smoking and drying with their capital. This will require the establishment and strengthening of female fish monger groups/cooperatives for sustainability 	<ul style="list-style-type: none"> • Research and development programs on appropriate farm technologies for women would be supported for all the different crops grown • Provide women and youth with credit to purchase implements to increase hectareage thus increasing production • Train women and youth on the use of the tested and recommended technologies by the agricultural extension system 		
<p>Appropriate technologies for female and youth farmers</p>			

Policies	Strategies	Constraints	Opportunities
	<ul style="list-style-type: none"> • Embark on the IEC programs that change the attitudes of female farmers on those beliefs that state that women should not own and keep assets • NGOs in the agriculture and government extension services would harmonize their efforts and intensify the provision of more appropriate technologies such as dehulling, processing equipment for grains to alleviate the arduous workload of women 		
Reliable sources of water	Develop a policy accompanied by an action plan to provide reliable sources of water for agricultural projects through the exploitation of the deep sandstone aquifer water resources using appropriate renewable energy technologies	<ul style="list-style-type: none"> • NGOs active in the area of agriculture, especially horticulture would be encouraged to embark on more water projects not only for consumption but also for agricultural purposes • Schemes such as the then irrigated water systems in the Western Division namely in Banjulinding, Sukuta and Kafuta would be reintroduced for organized women's groups 	

Policies	Strategies	Constraints	Opportunities
Training	<ul style="list-style-type: none"> Involve more women and youth in the annual agricultural farmer training conducted at the mixed farming centres and other relevant places Organize and train women to form self-managed (kafo) groups to take up the negotiations of their market prices in the areas of horticulture, fisheries, food and crop production. This will build more confidence in women and ensure sustainability. The sociological and managerial aspects of kafos are important here and will be a focus based on carefully selected strategies The provision of appropriate techniques should go along with a training package for use by women so that the equipment will not end in the hands of their male partners 	<ul style="list-style-type: none"> To ensure the availability of food all year round, especially vegetables and fruits, food preservation and processing are very necessary. This is an area where women are lagging and would be given urgent attention to attain self-sufficiency. The Department of Food Technology Services (DFTS) of DOA has done several pilot studies/ programs in this area, which would be expanded and intensified Organize and train female farmers to produce quality food and also to prepare and consume the required foods for a nutritional purpose and a balanced diet. An action plan which eloquently ties local production to home consumption demands/trends would be elaborated for all the subsectors 	

Policies	Strategies	Constraints	Opportunities
<p>Marketing</p>	<p>Private sector involvement in the marketing of agricultural produce will be further encouraged. Government concessions and well thought out marketing incentive packages will be provided for the private sector to help in this regard</p>	<ul style="list-style-type: none"> • Women will be encouraged to form marketing groups to bargain for their prices. The cooperatives and agricultural extension systems will be instrumental in this regard. Although the concerned extension workers will have to be given gender sensitive orientation sessions • Women will be linked to potential buyers through an out growers scheme with commercial producers. This would involve the playing of pro-active roles by the individual extension worker in complying with the production and marketing plans of the commercial producers • Market information and pricing indicators will be provided to women in the best and most appropriate languages they could understand at all times. This should be a joint effort between the government and NGOs. The DPS will be strengthened to have a unit specializing in the timely provision of such market information (appropriately desegregated by gender) for horticulture and allied sectors 	

Annexe III. Government of the Gambia budget appropriation report 2021

Table 47. Government of the Gambia budget appropriation report 2021

GMD		
BE code	Budget entity description	Appropriation 2021
1	Office of the President	627,443,812
2	National Assembly	246,406,737
3	Judiciary	181,771,775
4	Independent Electoral Commission	314,150,402
5	Public Service Commission	10,774,777
6	National Audit Office	128,200,228
7	Ministry of Defence	757,541,349
8	Ministry of Interior	1,037,282,618
9	Ministry of Tourism and Culture	37,809,589
10	Ministry of Foreign Affairs	923,311,478
11	Ministry of Justice	146,544,393
12	Ministry of Finance and Economic Affairs	1,013,197,461
13	Pensions and Gratuities	367,678,000
14	Ombudsman	21,882,944
15	Centralized Services	2,127,000,000
16	Ministry of Lands and Regional Government	173,843,000
17	Ministry of Agriculture	402,753,336
18	Ministry of Transport, Works and Infrastructure	1,974,520,126

GMD		
BE code	Budget entity description	Appropriation 2021
19	Ministry of Trade, Industry and Employment	101,236,036
20	Ministry of Basic and Secondary Education	2,811,691,288
21	Ministry of Health	1,602,626,438
22	Ministry of Youth and Sports	117,679,522
23	Ministry of Environment, Climate Change and Wildlife	218,866,796
24	Ministry of Information, Communication and Infrastructure	80,588,977
25	Ministry of Fisheries and Water Resources	53,892,275
27	Ministry of Higher Education, Research, Science and Technology	274,159,669
29	Ministry of Petroleum and Energy	187,536,506
31	Ministry of Women, Children and Social Welfare	92,878,464
33	National Human Rights Commission	41,483,030
50	National Debt Service	5,999,484,701
Total appropriation		22,074,235,727

Annexe IV. The livestock sector and investment policy toolkit (LSIPT)

LSIPT was developed by a group of international agencies that include CIRAD (France), the FAO, the World Bank, ILRI and others under the aegis of ALive at AU-IBAR.

LSIPT is the most rigorous livestock sector analysis tool that uses mathematical models, format questionnaires and other aids. LSIPT consists of a set of interacting and individual tools and checklists, divided into three phases of the analysis:

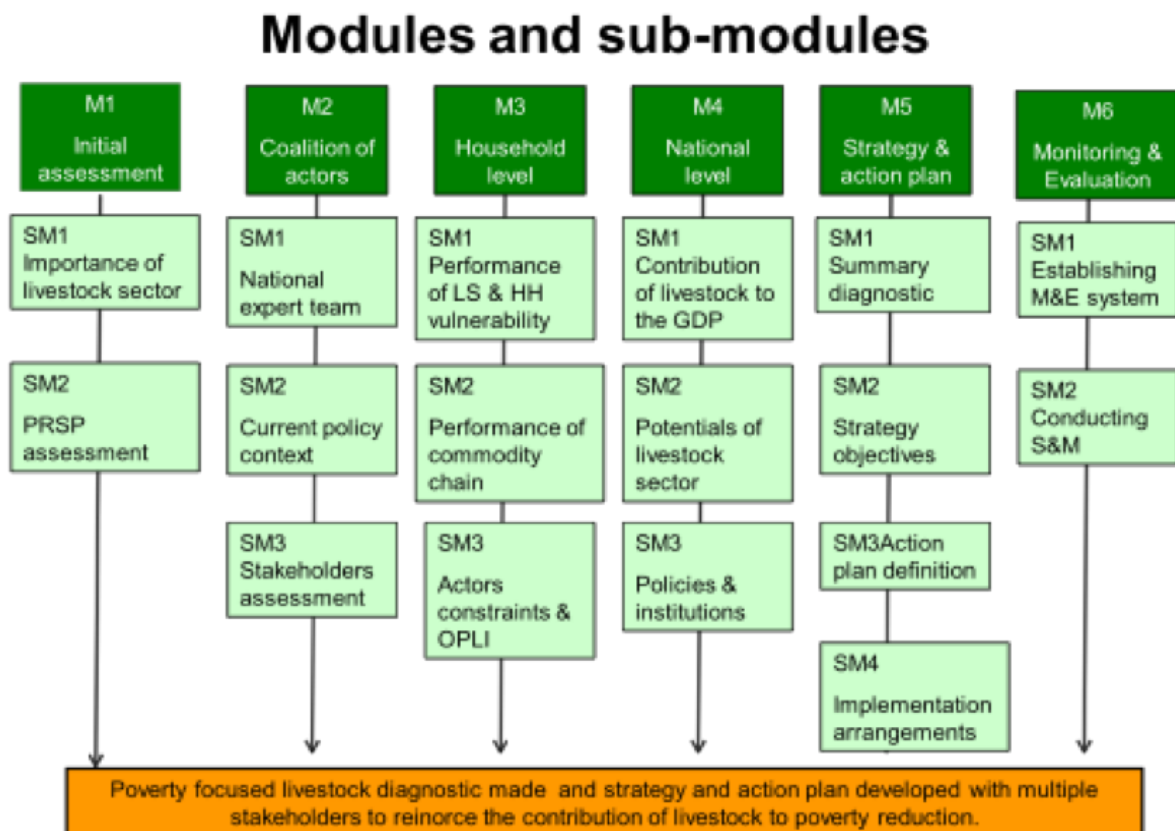
- Based on an initial survey of the importance of livestock (module 1), a first phase look at how well livestock is represented in the national development strategy and budget documents and if the sector has unnoticed and unrealized potential. A set of tools in module 2 help set up a preparatory analysis of the needs (worker, budget) and participatory mechanisms (steering committee, stakeholder consultations) to do a detailed, quantitative sector analysis.
- In the second phase, the tools in module 3 help to develop a typology of the prevailing livestock production systems, carry out a detailed analysis of the contribution of livestock to the household economy for each of these production systems and assess the defined key quantitative (volume) and financial parameter of the main value chains. Then, the tools in module 4 help illustrate the sector's direct and indirect contributions to the national economy and provide the instruments for assessing the main technical (feed, genetics and health) and political and institutional constraints.
- In the third phase, the tools in module 5 allow for a participatory process to set development priorities to evaluate the impact of alternative policy investment scenarios following these priorities. In addition, the third phase uses module 5 tools to test the economic, social, nutritional and environmental impact of these scenarios. Module 6 then guides monitoring and evaluation.

It enables in-depth and systematic quantitative analysis of the livestock sector's significant constraints and the effects of proposed interventions on economic growth and poverty alleviation. LSIPT uses cost-benefit analyses of proposed policy and technology investment options to enable investment scenario analysis, guiding for prioritizing investments according to their potential impacts on private and social development goals.

ALive, housed in AU-IBAR, agreed and provided a team with training and technical support for implementing LSIPT and best capitalize data to develop livestock sector analysis. Then, LSIPT has been used to analyse the livestock sector of many countries: Zambia, Ethiopia, Tanzania, Rwanda, Uzbekistan and India (Bihar and Odisha). There is also huge interest from other countries to use this tool in their livestock sector analysis.

Further description of the LSIPT methodology can be accessed at the LSIPT website (www.alive-ls iptoolkit.org), with the username and password to be provided by contacting the authors of this report.

Figure 15. Diagram showing the different modules and submodules of LS IPT.





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ILRI

The International Livestock Research Institute (ILRI) is a non-profit institution helping people in low- and middle-income countries to improve their lives, livelihoods and lands through the animals that remain the backbone of small-scale agriculture and enterprise across the developing world. ILRI belongs to CGIAR, a global research-for-development partnership working for a food-secure future. ILRI's funders, through the [CGIAR Trust Fund](#), and its many partners make ILRI's work possible and its mission a reality. Australian animal scientist and Nobel Laureate Peter Doherty serves as ILRI's patron. You are free to use and share this material under the Creative Commons Attribution 4.0 International Licence ©.

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