

Review of South Sudan's poultry subsector performance: Constraints and untapped opportunities

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Received Date: 21 July 2026 | Accepted Date: 10 August 2026 | Published Date: 30 August 2026

ABSTRACT: South Sudan's poultry subsector is a critical yet underdeveloped pillar for improving food security, rural livelihoods, and economic growth, with an estimated annual production of 6.05 million birds. While the sector is currently dominated by indigenous breeds (Beledi) kept in low-input, free-range systems, it has recently gained momentum as a priority livestock value chain for investment. This review evaluates the subsector's performance, identifying key constraints and untapped opportunities through a systematic analysis of literature and official reports. The subsector currently faces significant systemic barriers, including a high prevalence of diseases like Newcastle Disease (NCD), weak veterinary infrastructure, and a lack of public extension support. A primary constraint is the total dependence on imported inputs; there are currently no commercial hatcheries and feed mills in South Sudan, and all day-old-chicks (DOCs) and poultry feeds are imported from neighbouring countries. This dependency makes production highly susceptible to currency depreciation, high transit costs, and supply chain disruptions. Consequently, domestic supply cannot meet rising urban demand, necessitating the importation of 2,668 tons of poultry meat in 2022 alone. Despite these challenges, the sector offers immense potential for poverty alleviation and socio-economic transformation. Poultry production requires minimal land and capital, offering a rapid, low-risk livelihood option for displaced persons and returnees. Furthermore, since women manage 65 per cent of traditional poultry, the subsector serves as a vital entry point for women's economic empowerment and improved household nutrition. Untapped opportunities include the domestic availability of grains for local feed milling and the use of thermostable vaccines delivered via community-based animal health worker (CAHW) networks. The review concludes that with targeted investments in local hatcheries, feed mills, and strengthened disease control, South Sudan can achieve poultry self-sufficiency.

Keywords: Day-old-chicks, free-range, demand, investment, poultry.

INTRODUCTION

South Sudan's poultry subsector is underdeveloped, yet it serves as a critical pillar for improving food security, rural livelihoods and economic growth, with an annual production estimated at 6.05 million poultry – predominantly indigenous chickens and ducks (FAO, 2024). The indigenous chicken (Beledi) comprises the largest proportion, at 60 per cent, followed by dwarf at 32.5 per cent and bare neck at 7.5 per cent (Kodit *et al.*, 2023).

Chicken meat remains an affordable and accessible

source of protein across sub-Saharan Africa due to its low-fat content and acceptability in different cultures (Erdaw and Beyene, 2022). In South Sudan, poultry has the capacity to provide the much-needed animal protein and generate household incomes.

A study conducted in Juba County in 2020 revealed that the upsurge in poultry markets and fast-food outlets in Juba city and the surrounding areas creates easy access to cheap poultry products, allowing consumers to acquire

these essential nutrients for healthy growth and nourishment (Lado *et al.*, 2020; CAMP, 2015).

On the other hand, the rising demand for poultry products can at the moment be met by imports, leading to the importation of 2,668 tons of poultry meat in 2022 alone (FAO, 2024). Despite this growing demand, the poultry subsector is being constrained by a myriad of challenges limiting its full potential (CAMP, 2015).

Furthermore, the subsector is still seen as a backyard affair, faced with diseases, feed shortages, poor genetics, and market fragmentation, although it has the potential to diversify and transform the country's economy, contributing to food security, poverty alleviation, and socio-cultural stability. Additionally, weak policy framework and a lack of public extension support are systematic barriers affecting the capacity of small-scale producers to increase production (FAO, 2024).

Currently, the subsector has begun to gain momentum, as it has been identified as one of the four livestock value chain priorities alongside beef, dairy, and small ruminants earmarked for investment in South Sudan. This is due to the modest investment it requires to yield enormous benefits in food security and household incomes (FAO, 2024). On the other hand, commercial production is also picking up, mostly around Juba city and the peri-urban areas, which attracts attention to the subsector, with several donor-funded restocking and training schemes for women and internally displaced persons being implemented (FAO South Sudan, 2021).

In rural areas across South Sudan, almost every household keeps poultry – mainly the indigenous chickens – which are easier to raise with low capital requirements and their ability to roam freely around homesteads for insects and leftovers. Although the low profile of the subsector has received very little attention from policymakers and researchers for many decades, recently it has begun to be included in discussions involving ruminants, especially commercial poultry production (CSRF, 2020).

If the circular economy model is integrated into the subsector and gaps in policy and regulatory frameworks are addressed, high input costs can be mitigated, leading to improved performance of the poultry value chain in the country (Shuma *et al.*, 2026). Therefore, this paper aims to synthesise the performance of the poultry subsector to:

1. Identify the main challenges hindering its growth and development; and
2. Evaluate the opportunities that could be tapped for the subsector to flourish.

METHODOLOGY

A systematic literature search of databases of Google Scholar, journals, universities, Claude AI and Notebook LM, online repositories of regional, UN and government

agencies, and international NGOs was conducted. Also, keyword navigation using specific combinations such as “poultry production”, “performance”, “constraints” and “opportunities”, and “South Sudan”, etc. was applied.

Inclusion criteria were employed, focusing on relevant texts published mostly in the past twenty years from baseline surveys and rapid assessments, journal articles, thesis reports, conference and seminar papers, official reports, and case studies in the poultry value chain and production systems in South Sudan, the East Africa region, and the rest of Africa.

Lastly, thematic analysis was done using data extraction and categorisation into core thematic areas such as production systems: backyard versus commercial production systems; breed: indigenous versus exotic chicken; health challenges: weak veterinary infrastructure versus susceptibility to diseases like NCD, among others.

ORGANIZATION OF THE POULTRY SUBSECTOR

Free-range and backyard system

In South Sudan, the indigenous chickens, locally referred to as Beledi (Baladi), are kept under a free-range system where chickens scavenge and roam around homesteads. At night, the birds find shelter in trees, in rudimentary pens, kitchens, and in main houses with the families. They are managed with minimal housing, feeding, and healthcare and are often left to roam freely with their chicks. In this situation, the chicks are preyed on by predators, including pest and disease attacks, resulting in low survival rates. Poor management of laying hens leads to poor egg production of about 36-48 eggs per hen annually (Muasya *et al.*, 2022).

However, indigenous chickens are hardy and can thrive under conditions that no exotic breeds could withstand, even though their productivity still remains very low (FAO, 2024). Women and children provide the daily care for indigenous chickens while men retain control of the birds as household assets (FAO South Sudan, 2021).

On the other hand, backyard poultry is equally a promising enterprise with great potential for alleviating poverty and malnutrition in the most rural households, and in urban and peri-urban settings. Increasing human population and urbanisation have led to a gradual increase in demand for poultry products such as eggs and meat.

Furthermore, the affordability and nutritional value of poultry products are increasingly preferred in urban settings. This has created a wide range of enterprise opportunities across the entire poultry value chain that is yet to be fully exploited (CAMP, 2015). To realise tangible socio-economic improvements for low-income households through poultry enterprise in South Sudan, well-defined and targeted poultry sector interventions are required to systematically address obstacles and barriers to entry, especially for women and displaced persons.

Emerging commercial production

Commercial layer and broiler chicken units have begun to upsurge in Juba and the surrounding peri-urban localities. A recent survey conducted by FAO revealed that about 20 small-scale and two medium-scale commercial producers were recorded in these areas, marking a significant shift in the subsector as the country's population increases with rising demand for animal-source foods (FAO, 2024).

However, commercial production operations depend entirely on imported inputs such as day-old chicks, feeds and feed ingredients, and veterinary inputs (vaccines and drugs), which makes them susceptible to currency depreciation, multiple highway levies, border closures and supply chain disruptions that characterise South Sudan's economy (FAO, 2024). Also, rising private investment proposals for medium-scale broiler and layer production in Juba and peri-urban areas indicate the need for entry and capital (FAO, 2024).

Drawing lessons from neighbouring Kenya, where commercial poultry production is concentrated within urban and peri-urban areas, which provide a ready market for poultry products (Yensuk *et al.*, 2019), indicates that South Sudan could equally benefit from this experience with targeted development of commercial hatcheries and feed factories offering hybrid day-old chicks and quality feeds to commercial producers.

Poultry contribution to food security and income

Poultry meat is a crucial source of animal protein essential for human growth due to its delicacy, sufficient nutrients, affordability, and preference by the vast majority of consumers worldwide with different cultural backgrounds (Wahyono and Utami, 2018). Research shows that poultry meat has less cholesterol as compared to red meat (Erdaw and Beyene, 2022).

In South Sudan, the poultry subsector contributes immensely to food security and household incomes in addition to socio-cultural and religious benefits. Furthermore, local chickens can easily be converted to cash during emergencies, unlike large ruminants, which are mainly kept for prestige and only sold as a last resort (FAO, 2024).

Despite contributing immensely to the local economy, South Sudan continues to import enormous amounts of frozen chicken annually to meet the growing domestic demand from urban dwellers, hotels, groceries, and supermarkets. As reported above, South Sudan imports thousands of tons of frozen chicken meat every year, although recent data show a significant decline of 31.26 per cent (FAO, 2025). This therefore presents an untapped potential, filling the gap between what the country produces and what it consumes.

To improve poultry production, including boosting meat and milk production from large and small ruminants, FAO

projects that an estimated investment budget of USD 164 million is needed, which could also bolster processing and commercialisation. This could benefit up to 442,596 farmers in South Sudan. The internal rate of return (IRR) for this investment is estimated at 19.41%, with a net present value (NPV) of USD 61.5 million (FAO, 2025).

CONSTRAINTS FACING THE POULTRY SUBSECTOR

Diseases, pests and high veterinary costs

Weak disease prevention and control measures expose poultry birds to many diseases and pests such as highly pathogenic avian influenza (HPAI), Newcastle disease (ND), infectious coryza, coccidiosis, fowl pox, chicken mites, etc., that spread from one household/farm to another through roaming birds, humans and motor vehicles. Although a highly pathogenic avian influenza (HPAI) outbreak has not been reported in South Sudan at the moment, it has been reported in West and Southern Africa since October 2025 (FAO, 2026).

As of July 2026, 73 HPAI events have been recorded in South Africa, Nigeria, Ivory Coast, Senegal, and Namibia, affecting poultry species like chickens, turkeys, and ducks, among others. HPAI significantly impacts regional and global biosecurity and trade; as such, South Sudan needs to strengthen its capacity to detect, investigate, and respond to such a pandemic amidst funding constraints (WHO, 2019).

Additionally, the high cost of veterinary services, including vaccination and treatment, affects many poultry farmers who can hardly afford them (Kirwa *et al.*, 2010). Studies from the region identify ND as the leading cause of chicken mortality in backyard flocks, capable of wiping out entire village flocks in a matter of days if no emergency intervention is undertaken (Ouma *et al.*, 2023).

Furthermore, the veterinary infrastructure is weak and cannot adequately contain disease outbreaks of high prevalence. Furthermore, inadequate solar-powered vaccine cold storage, weak extension services coupled with a lack of community awareness on vaccination schedules continue to confront the poultry subsector (Ouma *et al.*, 2023).

On the other hand, other recurring ailments such as worm infestations, coccidiosis, fowl pox, and infectious coryza present a burden as they rarely receive attention compared to ND. This is due to the fact that these conditions are less prevalent and require minimal diagnostic intervention in rural settings (Ouma *et al.*, 2023).

Heavy dependence on imported day-old chicks (DOCs)

Indigenous chicken strains are hardy and resilient but have

low productivity compared to improved genotypes, limiting income to farmers who may want to intensify production. The improved layer or broiler strains that are suitable for commercialisation are mostly imported into South Sudan from Uganda and Kenya (FAO, 2024). This places these critical inputs beyond the reach of most small-scale farmers who lack the capital (hard currency) to purchase them.

No commercial hatcheries are producing hybrid DOCs in South Sudan, and the farmers in the country rely on imports for this input at the moment. However, logistical risks coupled with transit fragility place progressive farmers between choosing indigenous chicken with low productivity and imported strains which are expensive, given the rising inflation.

Furthermore, poor road conditions, bad handling during transportation, temperature variations, and border clearance delays, especially at Nimule border post, may affect the survival rate of the chicks before reaching their intended destination.

Lack of feeds and high cost of the same

South Sudan depends entirely on its neighbours for importation of poultry feed and feed ingredients. Lack of domestic feed mills in the country forces commercial farmers to import poultry feeds expensively, making production costs unsustainable for most farmers. On the other hand, the high cost of feed presents a tremendous challenge not only to the stakeholders in the subsector, but also affects the overall competitiveness of South Sudan's livestock sector. In addition, multiple cross-border and highway tariffs and rising fuel prices continue to affect the cost of poultry feeds.

Depending on the intensity of production, feeds normally account for 60-80 per cent of the total production cost in Kenyan poultry farming ventures (Ochieng *et al.*, 2013). This is within the range reported by Emam and Hassan (2011) that feed costs in small, medium and large-scale poultry farming in Khartoum State of Sudan represent 59.1, 60.06 and 61.60 per cent, respectively.

On the other hand, Sudan's 2023 conflict has affected feed prices, compounded by a 22 per cent rise in total production cost, from USD 0.95/kg live weight to USD 1.75/kg live weight (Abdalgilil, 2025). Before the war, Sudan supplied South Sudan with considerable volumes of animal feed and feed ingredients. Thus, in a bid to reduce feed costs, many farmers tend to mix good-quality feed with low-grade ingredients, resulting in poor flock performance (Yensuk *et al.*, 2019).

FAO's recent assessment on agricultural investment found that a lack of locally produced poultry feed poses a great challenge for the subsector's progress, affecting the prices of poultry products and placing them beyond what ordinary citizens could afford (FAO, 2024). This relates to studies across the continent, pinpointing that the lack of affordable and reliable feed ingredients such as maize,

sorghum and soybeans consistently affects the expansion and sustainability of poultry production (Graber, 2026).

Poor infrastructure and inadequate market information

Lack of good roads, cold storage facilities and processing plants limit the subsector's ability to consistently supply quality poultry products to markets in Juba and other major towns in South Sudan amidst the growing demand (FAO, 2024). Almost every infrastructure within the poultry value chain is absent, including a lack of hatchery, feed-milling, and centralised slaughter facilities, restricting market access in the country.

Major towns like Juba, Aweil, Bor, Malakal, Wau, and Yambio have inadequate market infrastructure for collecting poultry products (such as eggs and meat) for sale. This leaves most producers with no option other than selling their products in open-air markets, which are frequently disrupted by weather events. Good infrastructure facilitates efficient market performance, affecting producer prices.

Furthermore, there is an inefficient market information system across the country, which affects market competitiveness. This leads to market distortion, resulting in a high cost of conducting business. As local capacity sits underutilised, the demand for poultry products keeps growing while supply struggles to keep pace with it, and as a result, hotels, groceries, and supermarkets have to rely on imports for poultry meat and eggs (FAO, 2024).

Weak extension services

The weak extension services affect not only the ruminant subsector, but also constrain the poultry subsector. This manifests itself through logistical and accessibility challenges, an inadequate number of skilled extension agents, and low budget allocation. Specifically, the poultry subsector is constrained by the absence of poultry-specialist extension agents and a lack of poultry-specific training curricula. This is compounded by less policy attention directed to the subsector following long years of civil war (CSRF, 2020; World Bank, 2023).

Recurrent conflict and insecurity continue to disrupt input supply chains and market access, and displace thousands of families who have to leave behind their animals, often with no capacity to restock without external support (FAO South Sudan, 2021).

To strengthen extension services and contribute to agricultural transformation in the country, international agencies (such as FAO, GIZ, and NGOs) have been investing in training lead farmers by establishing farmer field schools (FFS) in donor-funded project locations. This crucial farmer-to-farmer approach helps empower local lead farmers who, in turn, cascade successful practices to other farmers in their communities for boosting food production (Detlef and Oesterle, 2017).

Gender dynamics

In free-ranging systems in many African countries, women participate actively in feeding the chickens, monitoring their health, and collecting eggs, yet they have little voice on how poultry income should be spent compared to men (Heckert *et al.*, 2023; FAO South Sudan, 2021). Contrary to that, Kodit *et al.* (2023) found that 67.5 per cent of women in Juba and Terekeka Counties in South Sudan make chicken and egg selling decisions, while men only retain 32.5 per cent of the decisions. This shows that women in the country are increasingly participating in ownership, management, and the decision-making process in family poultry keeping. However, lack of access to credit, training opportunities, and improved inputs constrain women's ability to scale up poultry production (FAO South Sudan, 2021; Wong *et al.*, 2017).

Additionally, education and literacy gaps affect women's access to resources, as their literacy rate falls behind that of men, with only 15 per cent compared to 40 per cent for men, for those over 15 years of age (CAMP, 2015). Conversely, family responsibilities such as childbearing, caregiving, and household chores, including walking long distances in search of water and fuelwood, expose women to protection risks. Maternal mortality adds to the list of burdens borne by women in the country, with South Sudan's maternal mortality rate being one of the highest in the world – 1,150 per 100,000 live births – mainly due to limited access to health services (UNICEF, 2026).

Elsewhere in Africa, studies in the poultry value chain reveal that household nutrition and child feeding tend to improve when women have more control over poultry income and decision-making, but realising this requires intentional design in the subsector (Heckert *et al.*, 2023).

UNTAPPED OPPORTUNITIES IN THE POULTRY SUBSECTOR

High market demand

As stated above, the demand for poultry products is so high that domestic supply cannot keep pace with it. In 2024 alone, South Sudan imported poultry meat worth an estimated USD 3.74 million, making the country the 175th largest importer of poultry meat in the world (OEC, 2026). Accordingly, poultry meat was imported from Brazil (USD 1.8M), Ukraine (USD 1.2M), Uganda (USD 606k), the United States (USD 61k), and Poland (USD 48.7k). Furthermore, between 2023 and 2024, South Sudan was the fastest-growing market for poultry meat from Uganda and Ukraine, estimated at USD 405k and USD 141k, respectively (OEC, 2026).

Earlier, Lado *et al.* (2020) reported that the main buyers of poultry products in Juba are hotels and restaurants, followed by individual consumers and other buyers, representing 61.1, 25, and 13.9 per cent, respectively. In order of preference, consumers prefer Indbro Rainbow Roaster from Uganda (42 per cent) and indigenous breeds

(30 per cent) to Ross 308 Broiler (22%) and Indbro Fast Broiler (6 per cent). At the same time, frozen chicken accounts for 72 per cent of consumer preference patterns, while Indbro Rainbow Roaster from Uganda and local breeds account for 28 per cent (Lado *et al.*, 2020).

Open entry and high returns

There are low barriers for venturing into poultry production, which requires little capital, a small piece of land, and a shorter production cycle. For instance, broiler chickens can be raised and sold within weeks, as well as laying birds, which start laying in a matter of weeks rather than years. Due to these factors, poultry remains one of the accessible livelihood options for households with limited assets, including displaced persons and returnees whose families may have lost their stock to conflict or natural shocks like flooding, drought, and diseases (FAO South Sudan, 2021).

In such a situation, recovery programs can be designed to distribute starter flocks of about four hens and a rooster, besides basic housing and husbandry training. Such a program with little initial capital can translate into a viable family enterprise within a single production cycle (FAO South Sudan, 2021).

Women's economic empowerment

Women play a pivotal role in South Sudan's poultry subsector, making up 65 per cent of traditional free-range poultry keepers in the country. Due to women's domination of day-to-day management of poultry, despite barriers mentioned above, the subsector offers a genuine entry point for programs aimed at their economic empowerment, food security and household nutrition, unlike ruminant-centred interventions, which are mostly controlled by men across different communities in South Sudan (CSRF, 2020; FAO South Sudan, 2021).

Eggs and meat provide indispensable proteins for combating malnutrition in pregnant and lactating women, and children under five. Also, sales of poultry products contribute significantly to rural household incomes, providing quick cash for paying household bills. In West Africa, gender-responsive poultry value chain programs combine input support with deliberate attention to women's control over income and decision-making, which shifts household bargaining dynamics in ways that input distribution alone cannot achieve (Heckert *et al.*, 2023; Desta, 2021).

Growing investment support

South Sudan's poultry subsector, long dominated by small backyard flocks, is beginning to attract more structured attention from government, international agencies, and private investors. While the subsector remains modest in

scale, the past decade has seen a shift from purely subsistence-level chicken keeping toward efforts aimed at building a more commercial, resilient value chain.

Under the FAO-supported Hand-in-Hand Initiative, South Sudan has put forward investment cases intended to modernise its agriculture and livestock sectors as part of a broader push for economic diversification away from oil dependence. Poultry and milk production, processing, and commercialisation are explicitly identified as priority areas, alongside sorghum, rice, and fisheries development, reflecting a government strategy to treat livestock – including poultry – as a driver of inclusive growth (FAO, 2024; FAO, 2023; MLF, 2025).

FAO has also worked directly with vulnerable communities to rebuild poultry-based livelihoods. In Maban County of Upper Nile State, a European Union-funded project supported around 30 displaced families to raise and sell live chickens and poultry products as a primary income source, pairing the distribution of starter flocks with training in improved, locally built poultry housing and animal management. Similar community-level poultry support has featured in FAO's broader climate-resilience work in South Sudan, which has focused heavily on water access and livestock recovery amid recurring floods and drought (FAO, 2024; FAO South Sudan, 2021).

Separately, the Ministry of Livestock and Fisheries (MLF) has been developing livestock investment projects – with backing from institutions such as the World Bank – aimed at improving animal health systems and building climate-smart production practices, an enabling environment that indirectly benefits poultry alongside cattle and small ruminants (MLF, 2025; World Bank, 2023).

Alongside donor-driven programs, small private poultry ventures have also emerged. Business proposals such as a layer-focused poultry farm near Juba illustrate the kind of small-to-mid-sized private investment appearing in the sector, typically combining founder capital with support from NGOs or sponsors to fund chicken housing, feed, and equipment, with the stated goals of creating local employment and improving affordable access to eggs and chicken meat.

Regionally, momentum for poultry investment across East and Southern Africa has been building through platforms like the Poultry Futures Forum, convened under the Southern Africa Poultry Initiative, which in its 2024 and 2025 meetings pushed for shared regional strategies to expand production, lower feed costs, and unlock private investment (TPS, 2025).

While South Sudan's poultry sector still faces significant structural constraints, the combination of government investment cases, UN-backed livelihood projects, and small private enterprises suggests a sector gradually attracting more sustained attention than it has in the past.

Community-based disease prevention and control initiatives

Community structures like the community animal health

workers (CAHWs) play a critical role in community-based surveillance (CBS)—a process in which communities take part in monitoring, detecting, reporting, and responding to priority endemic diseases including NCD, other zoonotic diseases, and vaccine-preventable diseases (WHO and CDC, 2010).

Due to small flocks dispersed across bomas and villages, which are rarely reached by veterinary staff, disease control in the poultry subsector depends heavily on community-level action rather than centralised veterinary infrastructure.

Across studies of village poultry in South Sudan, NCD is consistently identified as the leading cause of flock mortality, alongside losses from predation. A study of rural chicken management in Tonj County, Warrap State, found that disease and predation were the primary drivers of annual flock losses, with NCD singled out as the main constraint to village chicken rearing because of the severe die-offs it periodically causes (Jubara *et al.*, 2021a).

The same research group's follow-up study on chicken housing in Tonj County similarly noted that low-input husbandry contributes to high mortality, and recommended timing breeding and confinement around seasonal disease and predation risk rather than relying on formal veterinary intervention alone (Jubara *et al.*, 2021b). This pattern mirrors findings from neighbouring Sudan, where NCD has been confirmed as the major constraint on backyard poultry production through serological surveys showing widespread, unvaccinated exposure to the virus across multiple states (Hussein *et al.*, 2022).

In the absence of a dense network of government veterinarians, disease control in South Sudan's poultry subsector functions largely through informal, household- and community-level practices, supplemented by occasional external programs:

1. Traditional remedies and household management: In the Tonj County studies, households relied predominantly on traditional disease-control remedies rather than commercial vaccines or drugs, alongside locally built housing designs; most commonly dome-shaped shelters raised above ground level and constructed from bamboo, intended to protect birds from predators and, to some extent, disease exposure (Jubara *et al.*, 2021b). Researchers have called for Farmer Field Schools to help households adopt more effective, evidence-based housing and husbandry practices while building on this existing local knowledge.
2. Community animal health workers (CAHWs): While most documented community structure networks in South Sudan have centred on cattle, sheep, and goats, the same model, “training local volunteers to deliver basic disease surveillance, vaccination, and treatment services in areas that formal veterinary staff cannot reach,” has been identified by international agencies as directly transferable to poultry. FAO has trained large numbers of CAHWs across South Sudan to extend animal health coverage into remote

counties, an approach recognised regionally as a low-cost way to reach scattered rural flocks (FAO South Sudan, 2021).

3. Extension and marketing linkages: A related study of poultry marketing and trade in Juba County found that market access and disease losses are closely linked concerns for producers, with disease-related losses undermining the reliability of the informal poultry trade that many households depend on for income (Lado *et al.*, 2020). This underscores why disease control efforts are increasingly framed not just as animal-health work but as part of household economic resilience.
4. Regional models for scale-up: South Sudan has not yet developed its own large-scale, thermostable NCD vaccine program, but such community-vaccinator models have been tested successfully elsewhere in the region. In Sudan, the I-2 thermostable NCD vaccine, which does not require an unbroken cold chain and can be delivered by eye-drop or in drinking water, has been produced locally and applied through village-level vaccinators, resulting in substantial improvements in flock survival and household income (Khalafall *et al.*, 2028).

Comparable community-vaccinator models tested in Kenya and Tanzania, which combine farmer training in husbandry and biosecurity with paid or subsidised community vaccinators, have significantly increased vaccine uptake and reduced NCD-related deaths (Ogolla *et al.*, 2024; de Bruyn *et al.*, 2017). These models are widely cited as templates that could be adapted for South Sudan given the similarity of production systems.

Beyond routine NCD control, international guidance increasingly frames community participation as essential to detecting emerging threats such as highly pathogenic avian influenza (HPAI) in smallholder systems. The World Organisation for Animal Health (WOAH) has highlighted that the diversity and dispersal of smallholder poultry systems make community involvement central to effective surveillance design in resource-limited settings, a principle directly applicable to South Sudan's scattered village flocks (WOAH, 2024).

Availability of ingredients for local feed production

The inconsistency of South Sudan's poultry-feed problem is that many of the raw materials a compound feed factory would need are already grown in the country, just not for that purpose. South Sudan's Ministry of Agriculture and Food Security (MAFS) and the East African Community (EAC) list sorghum, maize, groundnuts, sesame, cassava, finger millet, rice, and sunflower among the country's major field crops, with dedicated investment opportunities identified for oilseed processing covering sesame, groundnuts, soybeans, sunflower, and cotton (MAFS/EAC, n.d; FAO, 2024).

Western Equatoria in particular has long been recognised

as a cereal-surplus, greenbelt zone capable of producing two harvests of maize and groundnuts a year, a pattern documented in FAO crop assessment missions stretching back to the 1990s and reaffirmed in more recent FAO and WFP (2026) reporting on the wider region.

However, in practice, these crops are grown mainly for direct human consumption or as cash crops, not diverted into an organised feed-milling supply chain. There is currently no significant industrial processing capacity converting local maize, sorghum, groundnut cake, or sesame cake into standardised, nutrient-balanced poultry rations. This mirrors a problem documented in neighbouring Sudan, where sorghum, groundnut cake, sesame cake, and wheat bran are the traditional backbone of poultry diets, but where researchers have repeatedly found that the nutrient content of these ingredients varies substantially from the values in standard feed-composition tables, undermining consistent ration formulation unless ingredients are analysed batch by batch (Babiker *et al.*, 2009).

Across the wider East and Central African region, researchers have spent the past decade looking for ways to stretch scarce conventional feedstuffs by validating non-conventional, locally available alternatives. In Sudan, one widely cited study profiled the chemical composition of groundnut cake, sesame cake, sunflower cake, baobab seed cake, and even earthworm meal as supplementary protein sources for poultry, explicitly framing the work as a response to the higher price and scarcity of conventional groundnut meal (Babiker, 2012).

Further afield, a 2025 review examined dried blood-rumen content mixtures from abattoir waste as a low-cost, high-protein substitute for imported soybean meal and fishmeal in Ethiopian poultry diets, noting that feed can account for as much as 70 per cent of production costs in similar smallholder-dominated systems (Shuma *et al.*, 2025).

These approaches are directly relevant to South Sudan, where abattoir by-products, oilseed cakes, and cassava peels are generated in quantity but are rarely captured for animal feed. Moreover, the country's 2025 net cereal production was estimated at 1.21 million tons, representing an 8 per cent increase from the previous year (FAO and WFP, 2026). This shows that key ingredients for poultry feed such as sorghum, maize, rice, and sunflower are available domestically and only require the establishment of local feed milling capacity (Ayul, 2010). This would create a market for smallholder grain farmers and reduce overreliance on imported feeds and feed ingredients, exposing commercial producers to import supply chain disruptions and currency risks.

CONCLUSION

South Sudan's poultry subsector is a critical yet under-developed pillar for food security and rural livelihoods, currently producing an estimated 6.05 million birds annually. The industry is dominated by indigenous (Beledi)

breeds managed in low-input, free-range systems, and it faces significant systemic barriers, most notably a total dependence on imported day-old chicks and feeds from neighbouring countries. This dependency, combined with high disease prevalence such as Newcastle Disease (NCD) and weak infrastructure, forces the country to import thousands of tons of poultry products annually.

However, the subsector offers immense untapped potential for poverty alleviation and women's economic empowerment, requiring minimal land and capital for entry. With targeted investments in domestic production capacity and disease control, South Sudan has a clear path toward achieving poultry self-sufficiency.

Limitations of this review include heavy reliance on grey literature and secondary data, absence of primary field data, and the likelihood that some cited statistics are already outdated given how quickly conditions change in South Sudan.

Recommendations

1. The Ministry of Livestock and Fisheries and relevant policymakers should strengthen livestock policy and regulatory frameworks, introduce investment incentives, and implement cost-reduction measures that promote sustainable circular-economy practices within the poultry sector.
 2. The Ministry of Livestock and Fisheries, state governments, and private-sector investors should establish and expand domestic hatcheries, feed mills, veterinary diagnostic laboratories, and solar-powered vaccine cold-chain facilities to reduce import dependence and improve poultry disease prevention and control.
 3. The Ministry of Livestock and Fisheries, state agricultural agencies, and development partners should recruit and train poultry-specialist extension agents and Community-Based Animal Health Workers to provide farmers, particularly in remote areas, with timely technical advice, vaccination, and basic animal health services.
 4. International agencies, NGOs, government institutions, and development partners should implement targeted poultry development programmes for women, displaced persons, and other vulnerable groups by providing starter flocks and practical training on improved husbandry, biosecurity, housing, and flock management.
- Private-sector investors, government agencies, research institutions, and development partners should invest in local feed production, research on non-conventional feed resources, poultry processing facilities, cold storage infrastructure, and digital market information systems to reduce production costs, improve market access, and ensure a consistent supply of quality poultry products.

CONFLICT OF INTERESTS

The authors declare that they have no conflicts of interest.

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