



Commercial poultry success stories in Sub-Saharan Africa: Senegal as a study case

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About IPAR

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Summary

The Senegalese commercial poultry sector has been very dynamic over the past 15 years with an increase in production and investment, creation of jobs and growing interest of the private sector. This study highlights the key success factors identified to better guide decision-making for the development of the poultry sector. Cross-case studies conducted made it possible to highlight the key success factors: business management and capacity strengthening, organizational support and integrated contracts, access to finance and quality equipment, increased demand, and creation of outlets for production, but also import suspension applied since 2005. Capacity strengthening is also a good way to manage risks, especially poultry diseases. Financing is also an important determinant of success. Self-financing is very common, but some enterprises benefit from financing programmes set up by the Senegalese government.

Protection from foreign competition through a sanitary barrier against avian flu has been associated with important domestic investment in the poultry sector. In addition, domestic market size and expected demand growth as well as the growth of the urban middle class with associated change in consumption are essential for profitable investments. Large-scale investments, backward integration and forward linkages in feed mills, day-old chick production, slaughtering and marketing have higher success rates.

Introduction

Background

Commercial poultry enterprises in sub-Saharan Africa have undergone rapid expansion and profound changes over the past decades.

A few elements of the literature

The Senegalese poultry value chain is a component of upstream sub-regional food systems and downstream globalized value chains. Thus, international meat markets constitute an environment from which it cannot be isolated. At the international level, poultry remains a key driver of growth in total meat production. International meat production has been stable through 2020 despite supply disruptions due to African swine fever in China and Vietnam, whose pork supply and consumption impacted those of all other meats. Projections towards 2029 did not foresee significant changes in the evolution of meat in the world, both for aggregate supply and corresponding demand (OECD/FAO, 2020). Meat production is maintained as a result of productivity gains. In both developed and developing countries, low production costs, short production cycles, good (low) poultry feed conversion ratios and relatively low consumer prices have strongly contributed to making chicken the preferred meat for both producers and consumers.

Furthermore, on the African continent, the expansion of intra-African trade is a very strong assumption since the ratification of the African Continental Free Trade Area (AFCFTA) and its implementation scheduled for July 2020 and then postponed to 2021 for 54 of the 55 African countries i.e. 1.2 billion inhabitants.

In the case of Senegal, the context is marked by structural weaknesses caused by over-reliance on imported corn, which is the main component of industrial poultry feed. In addition, there is recurrent pressure from Senegalese government partners to modify its border trade policy in accordance with bilateral and international agreements and to lift the ban on poultry meat importation. However, since 2005, a strong poultry industry has emerged in Senegal supplying consumer markets and also providing inputs and services to small and medium-sized poultry farmers as well as bigger commercial poultry farms.

Problem and Justification

The transformations achieved in the Senegalese poultry industry are not yet well documented because, on the one hand, the process is still ongoing and, on the other hand, the conditions conducive to the emergence of these enterprises have not been analyzed and compared within the region. It is in this context that the Centre for Development Research (ZEF) of the University of Bonn (Germany) in partnership with the Forum for Agricultural Research in Africa (FARA) based in Accra (Ghana), the Initiative Prospective Agricole et Rurale (IPAR) based in Dakar (Senegal) and research institutions in Nigeria and Kenya conducted a study on the success factors of commercial poultry farming in Kenya, Nigeria and Senegal. The objective of the study is to analyse the drivers of success of commercial poultry enterprises (which produce and sell chicken meat and eggs for consumption) to support policymakers and donors with the aim of further developing the commercial poultry sector in sub-Saharan Africa.

Research questions

The study attempts to answer three main questions: (i) What has been the evolution of the Senegalese commercial poultry sector over the last five years? (ii) What are the key success factors of the commercial poultry enterprises? (iii) What policies have enabled and will enable the development of the Senegalese poultry sector?

Methodology and data

To answer these questions, we focused on a sample of successful poultry enterprises. Specifically, we collected data on their production technology, marketing and risk management strategies, business constraints and success factors. This allowed us to confirm or refute the hypotheses formulated after a literature review on the key success factors of commercial poultry farming in Senegal and in the sub-region.

Outline

The following section presents the methodology adopted. It starts with a literature review on the key success factors of commercial poultry farming in Senegal and West Africa, followed by a presentation of the data collection methodology. The 3rd section summarizes the evolution of commercial poultry farming in Senegal over the past five years in terms of growth, policy environment, ease of doing business and poultry farm typology. The 4th section shows result from survey data from ten case studies of successful poultry enterprises and analyses the determinants of their performance. Finally, section 5 concludes by highlighting the lessons learnt from the study.

Study Methodology and Literature Review

Ten farms were selected based on a preliminary screening considering the type of poultry farming, the relative size compared to the small-scale units, the willingness of the operators to meet researchers. Each farm was approached and treated as a case to be studied thoroughly according to the framework of the study.

Approach to data collection

The study sample was selected using available information from a network of poultry farms monitored by day-old chick, broiler and table egg production. Farms selected were those whose owners were already known to be accessible and able to provide the information needed for the study. The selection of poultry farms was also made based on their number of years of existence with at least 4 years since their creation. The second criterion for the selection was based on the size of their production flock i.e. for commercial farms specializing in the production of broilers, they were expected to have a production capacity of more than 100,000 birds per year and for those specialized in the production of eggs, their flock was expected to be at least 25,000 birds. The last criterion was their level of organization and professionalism in managing a poultry enterprise.

Data collection was mainly organized in two phases: (i) a stage of prospection for poultry enterprises to be surveyed and (ii) a second phase involved interviews. During the first phase, field visits were made to gain a better understanding of field realities as well as the production and marketing environment of the targeted poultry enterprises. The visits made it possible to do GPS

surveys for the delimitation of the study area and the mapping of poultry businesses. The farms were mainly located in the regions of Thiès and Dakar, i.e. in the Niayes eco-geographic zone. In addition, photographs were taken in the field to illustrate equipment and production activities.

The second phase of the data collection was devoted to conducting Zoom (virtual) interviews, except for the first two interviews conducted on the farms. The field visits made it possible to better gauge the availability of the business owners and to opt for online interviews to facilitate participation and in-depth discussions in a calm environment far from the busy environment of the farms. Prior to the interviews, consent form and interview guide were prepared and communicated in advance to the interviewees. Each business was approached based on initial contact with the owners and then with the permission of the key personnel who managed the farm. After explaining the purpose of the interview requested, an appointment was made for discussion which was guided by questionnaire (Appendix 1). Each interview was conducted by two researchers for a maximum of two hours with notetaking or recording with the interviewee's permission. This approach provided an opportunity to present the research project, its approach and expected results, but also to obtain an informed endorsement from the target persons. Confidentiality of data was confirmed at the beginning and end of the interviews, and it was specified that the anonymity of the poultry enterprises surveyed would be respected (Appendix 2).

The questions asked during the interviews were mainly about the company and its history, the organization of production and marketing, its growth indicators, the success factors, the role of innovations in the company's success, its growth opportunities, the main constraints facing the company and finally the prospects for the production and marketing of poultry products.

All the interviews were then processed by each member of the research team separately and then collectively to compare or consolidate the information collected. The interpretations and the conclusions of the research were thereafter put together.

All results were then shared within the research team with the ZEF partners.

Literature Review

The factors for the emergence and expansion of modern poultry industry in Africa, and in particular in West Africa, are discussed in terms of population growth, increasing demand for poultry meat in major urban centres, trade policy, investment opportunities in poultry farming and a relatively stable international poultry input trade market.

Steinfeld *et al.* (2006) posited that geographical transitions in production systems in developing countries are materialising by bringing production areas closer to the major consumption centres. Faye and Alary (2001) also suggested that the development of short-cycle peri-urban livestock systems would probably be the best response to the increase in urban demand for meat in African cities. In addition to these strong trends, the progressive involvement of the private sector has generally resulted in the modernisation and industrialisation of poultry production in the South. According to Herrero *et al.* (2014), the transition of livestock systems is materialized by the expansion of monogastric production (poultry and pigs) towards industrial production systems. Indeed, the industrialization of production systems is expected with a substantial increase from 35% to 80% of monogastric products in Africa by 2050 with, in parallel, higher consumption in West Africa compared to other regions. It has been estimated that consumption will multiply by 6

or 7 in West Africa and by 4 in East and Southern Africa by 2050 (Herrero *et al.*, 2014) . The emergence of monogastric production and especially poultry production has thus been well predicted in West African countries.

The FAO (2009) had argued that the least developed countries, such as those in Africa, have real potential to develop the chicken market, as it is not yet saturated, and that 87% increase in meat production was projected from 2009 to 2018. Consequently, real opportunities for the development of the monogastric sectors (poultry and pork) are emerging for the current decades in conjunction with urban population growth. Indeed, the countries of sub-Saharan Africa will experience additional population growth of 329 million inhabitants by 2029, two-thirds of whom will live in urban areas. The symbolic mark of 500 million urban population would be exceeded in 2020 and the African urban population is expected to reach 775 million urban dwellers by 2030, or 47% of the total population (TACS Economic, 2017). In addition, nearly 100 African cities will have more than one million inhabitants by 2030. Consequently, the strong urban growth constitutes one of the drivers of the emergence of animal production sectors as a result of the increase and diversification of meat consumption. Animal production will thus grow by 25% by 2029. Poultry production is one of the sectors where growth will be most rapid (OECD/FAO, 2020).

However, the availability of feed resources for production remains a determining factor in the emergence of animal production chains. As at 2014, Delgado *et al.* (2014) in a prospective on the food revolution had estimated that the world production of cereals should increase by 292 million tonnes, from 1990 to 2020, to meet the demand for animal feed. These quantities had a priori already been reached, as the production of the United States was already estimated, for the same period, at more than 200 million tonnes of grain. In other words, the increase in demand for cereals is anticipated to guarantee monogastric production and in particular poultry production. Moreover, the revolution in the livestock sector was forecast to have no impact on world cereal prices, since price stability was guaranteed at least until 2020 with very minor fluctuations.

There are two main reasons for price stability. First, the existence of a production reserve ensures that the price is maintained on the international market. Indeed, the major producers such as the United States, Australia and Canada have vast tracts of land that can cope with a sudden increase in world demand for grain. Secondly, demand responds more quickly to price changes, as grain production is a very profitable investment for large producers. Finally, the increase in the consumption of animal products contributes to the decrease in direct human consumption of cereals. The OECD/FAO (2020) confirmed that maize production will increase from 193 million tonnes to 1,315 million tonnes over the next decade, in addition the international price of maize will rise at a lesser rate than inflation towards 2029. Thus, it appears that a stable international trade market combined with growing investment is key to explaining the emergence of the commercial poultry sector in sub-Saharan Africa.

Investment opportunities in African agricultural markets would amount to more than US\$ 100 billion by 2025 per year (ADB/ADF, 2016). From 2015 to 2025, investments for the transformation of 18 agricultural value chains would amount to between US\$ 315 and US\$ 400 billion. Moreover, the African agricultural market has remained attractive for investment, despite low agricultural yields. The substantial increase in food imports reflects strong demand. However, the involvement of the private sector is systematically required, as the capital to be mobilized far exceeds the resources of the African public sector.

It is important to note that the strong growth recorded has also been driven by protectionist policies which suspended chicken importation since 2005, following the outbreak of avian flu in West Africa. Indeed, these measures were put in place in the context of a surge in importation of poultry cuts that slowed down the local poultry industry. Johnson (2011), citing the example of Senegal, Cameroon and Ghana, pointed out that the three nations took different solutions in the face of pressure from producers to limit importation. Cameroon applied tariff and non-tariff measures (lowering quotas, stricter taxation of imports) while Ghana opted to support producers in the production process. In Senegal, producers launched a health awareness campaign against imported chicken to obtain consumer support and demand a halt to importation. Some African countries then took advantage of the health crisis to grant better trade protection to the poultry sector, which is a significant determinant of recent developments in poultry production in the region.

Rapid growth of the commercial poultry sector within UEMOA (West African Economic and Monetary Union) countries has been estimated at between 9 and 10% per year, which makes the modern poultry sector since 2005 one of the 5 sectors selected by the UEMOA Commission for protection measures (AEC, 2014). Thus, real investment needs exist, as the turnover of the sub-regional poultry sector is estimated on average at more than 172 millionUS dollars per year (UEMOA, 2008).

When analysed for West African countries, and Senegal in particular, growth factors in the poultry sector as highlighted in literature reflect the findings made for the agricultural sector in general. Population growth with a strong urban component and the relative increase in household purchasing power, especially in urban areas, are major causes, as in many other countries in the South. In addition, factors specific to commercial poultry farming are involved, namely technological progress in commercial poultry farming, whose technical itineraries have been adapted from countries already at the cutting edge or have been introduced without major obstacles. In addition, the increase in private investment has resulted from the niches offered by commercial poultry farming.

The expansion has been strongly encouraged by national trade policies and public sector support (training, advice), which have helped to capitalize on a market situation that is favourable to local production. It should also be noted that in addition to modern poultry farming, which is close to the production and processing standards of developed countries, modernized and semi-intensive poultry farming has also developed based on the growing interest of the population in poultry farming, especially small private promoters, youth and women's groups, who have been able to leverage their access to chicks and poultry feed market, as well as to technical supervision and veterinary services.

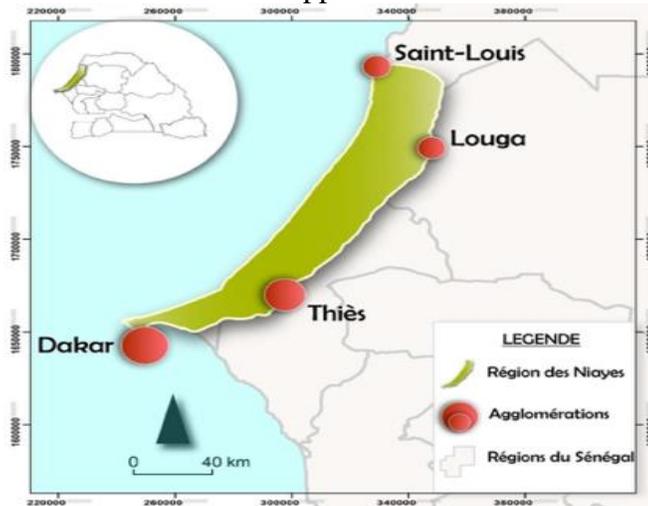
Commercial Poultry Development

Growth of the sector by type of production (meat, chicken etc.), the size of company, geographical distribution

- **Geographic distribution of commercial poultry operations**

Modern poultry farming in Senegal is mainly concentrated in the Niayes area which is spread from the Dakar region to Saint Louis via the Thiès and Louga regions. The Niayes area is located on

the northern coast of Senegal and extends over a coastal strip 180 km long and 20 km wide (Seck *et al.*, 2005) (Map 1). The high concentration of commercial poultry farms in this eco-geographic zone is mainly due to favourable climatic conditions for the development of exotic breeds (Traoré, 2006). From November to May, temperatures are mild and daily temperature ranges are low due to the maritime coastal winds (Ndao, 2012). A more precise spatial concentration is indeed observed in the peri-urban areas of Thiès, Tivaouane and Mbour and along the roads linking Dakar to these secondary urban centres. This concentration is marked by a dense network of semi-industrial and industrial poultry farms (Ly, 2020). Thus, the peri-urban basin of Dakar and its suburbs and the Thiès region accounts for 80% of modern poultry farms. Such a highly unbalanced concentration compared to the rest of Senegal is also coming from the demographic weight of the two basins, which is correlated with an economic, industrial and service hyper-concentration that creates a solvent demand and thus offers more opportunities to commercial poultry farms.



Map 1: Location of the Niayes area of Senegal
Source: Diop, 2018

Like all the other capitals of West African countries, Dakar is the economic lung of Senegal, since economic, industrial, and service activities, in particular, and administrative activities are concentrated there. In the early 2000s, the capital city accounted for 55% of national GDP and 2/3 of urban GDP, 94% of national enterprises, 83% of modern enterprises and 95% of industrial and commercial enterprises (Chenal and Wade, 2009; Diop, 2009; World Bank, 2015). The ANSD census conducted in 2013 show that for 342,550 industrial units accounted for, 64.9% are in Dakar which is followed by the Thiès region with 12.9%. Dakar is also the country's largest consumer market with an estimated population of over 3.8 million in 2020, or 23% of the national population (ANSD, 2020). Dakar remains by far the largest consumer market in the country. Consequently, in terms of potential, it is marked by the rising of an urban middle class over the past two decades whose growing demand impacts all economic sub-sectors and determines their evolution.

In addition, the proximity of poultry industrial units with all feed mills in the country (SEDIMA, AVISEN, PRODAS, NMA Sanders, SENTENAC etc), all hatcheries (SEDIMA, PRODAS, AVISEN, AVIVET, JAI LAXMI, AVIBOYE etc) and numerous veterinary outlets/clinics is a major asset for accessing inputs, equipment, and services essential in modern poultry production. Such proximity brings industrialists (feedmillers and hatcheries) within a maximum radius of 30 km of commercial poultry farms (FAO, 2014). Also, easy access to imported inputs through the

port and international airport in Dakar (now transferred to Ndiass) is an additional advantage which favours the concentration of farms near the capital (Arbelot *et al.*, 1997). On the other hand, the strong land pressure that has increased over the last five years has become one of the main constraints to the growth and viability of commercial poultry farms. Farms that are unable to relocate further east, north and south in the Niayes area of the Thiès region and the Diamniadio and Mbour¹ areas (south-east of Dakar) are becoming precarious as urbanization is encroaching around the farms and land prices for urban settlement are increasing.

- **Evolution of production volumes over the last five years**

Since the end of importation of poultry products in 2005, the modern poultry sector has strongly developed due to the dynamism of the private sector and improved production practices. The evolution, during the last five years, is characterized by an increase in all product segments of the commercial sector. Between 2015 and 2019, the production of broiler chicks increased by 40.47%, from 35 million chicks to 51.4 million chicks. As for laying chicks, their production level was 2.6 million in 2015 and 3.4 million in 2019 (an increase of 813,000 chicks or 13.48%). Production volume of poultry feed also increased significantly from 229,000 tonnes in 2015 to 328,000 tonnes in 2019, an increase of 98,000 tonnes or 17.62%. Consequently, the quantities of chicken (broiler and culled layers) and table eggs also increased. From 2015 to 2019, chicken production rose from 51,000 tonnes to 78,000 tonnes, an increase of 20.42%. Table eggs estimated at 514 million in 2015 increased to 885 million in 2019, an increase of 371 million (CNA, 2015; 2016; 2017; 2018; 2019).

The evolution of all segments from 2015 to 2019 resulted in increased turnover in the sector. In 2016, the production of chicks, chicken and table eggs generated a turnover of 271.7 million US\$² (chick production (36.3 million US\$), chicken (163.6 million US\$) and table eggs (71.8 million US\$)).

From 2016 to 2017, chicken production underwent an increase of 20 million birds, representing an estimated contribution of 272.7 million US\$ to the sector (MEPA/AEC, 2018; MEPA, 2020). Between 2018 and 2019, the turnover of the modern poultry sector increased from 482.4 million to 536.5 million US\$ i.e., an additional turnover of 54.1 million US\$ or 5.31% (CNA, 2018; 2019).

- **Chick production**

From 2015 to 2016, broiler chick production increased from 34.9 million chicks to 40.8 million chicks. Similarly, pullet chick production increased from 2.6 million in 2015 to 3.7 million in 2016, an increase of 1.1 million chicks (CNCR/MEPA, 2018). Between 2015 and 2016, chick production recorded a differentiated increase of 16.9% for broiler chicks and 49.8% for layer chicks. The first historical record of total chick production was recorded in 2016 with 44.5 million chicks equivalent to a turnover of 38.1 million US\$ (MEPA, 2020). This record was maintained in 2017 with a total production of 48 million chicks (45.2 million broiler chicks and 2.7 million-layer chicks) resulting in a turnover of 33.3 million US\$ and 4.4 million US\$, respectively (MEPA/DIREL, 2018). However, a decline in the production of pullet chicks was noted between 2016 and 2017 i.e., a reduction of 42%. This decrease was observed from 2018 to 2019 with a total of 56.3 million chicks decreasing to 54.78 million chicks. Such fluctuation is a result of the 1.67% decline in broiler

¹ Diamniadio is administratively part of the Dakar region and Mbour is part of the Thiès region.

² 1 US\$ = 550 CFAF

chicks production in 2019 which was mitigated by the 3.3% increase in layer chicks production in the same year. Turnover from chick production declined from 47 million US\$ in 2018 to 45.4 million US\$ in 2019.

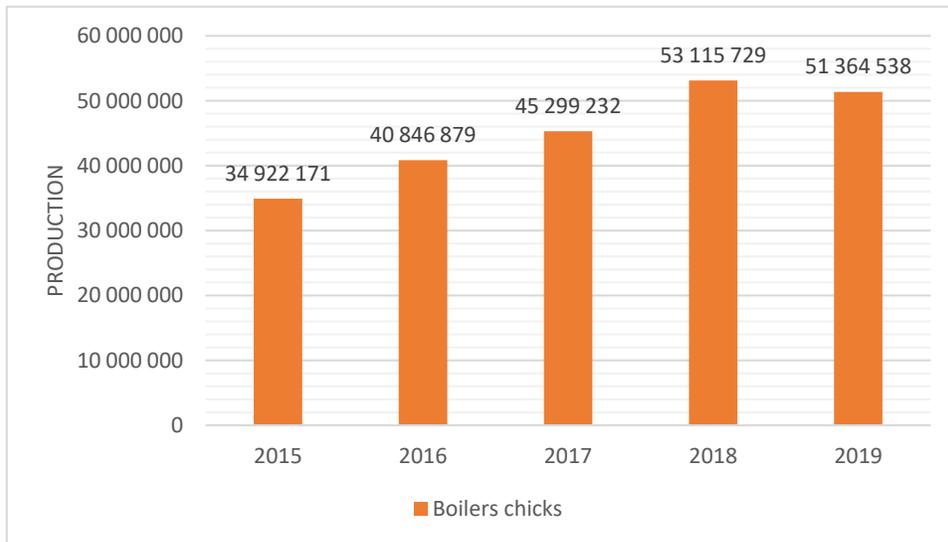


Figure 1: Production of broiler chicks (2015 to 2019)

Source: NAC, 2015; 2016; 2017; 2018; 2019

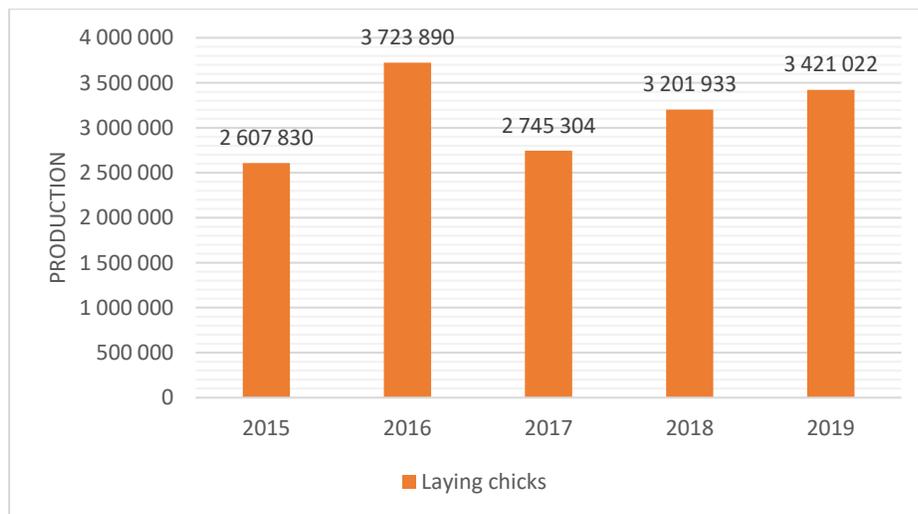


Figure 2. Production of laying chicks (2015 to 2019)

Source: NAC, 2015; 2016; 2017; 2018; 2019

The largest producers of chicks in Senegal in 2019 were SEDIMA (35.01%), AVIBOYE (14.49%), PRODAS (11.96%), AMAR (11.28%). This leading quartet is followed by 7 marginal players (SOSEPRA, EMAAP, JAI, LAXMI, SAPRAM, SENAV, VIRIDIS) whose productions ranged between 2 and 7% of the national total.

- **Production of poultry feed**

Poultry feed production has shown a positive development over the last five years (2015 to 2019). From 2015 to 2016, the quantity produced increased by 7.92% and the sales figures rose from 108.3 million US dollars to 127.3 million US dollars. Between 2017 and 2018, production increased from 312,565 tonnes to 314,224 tonnes, an increase in absolute value of 1.6 tonnes of feed. In 2017, feed for broiler production was 53% of the total production. An increase in the share of broiler feed (60%) was observed in 2018, while pullet feed production accounted for only 40% of total production. In 2019, the total feed production amounted to 328,048 tonnes, of which 195,185 tonnes was for broiler and 132 863 tonnes was for pullet/layer feed. The turnover of poultry feed in 2019 amounted to 158.6 million US \$ of which 100.9 million US \$ for broiler feed and 59.3 million US \$ for pullet/layer feed (MEPA, 2020).

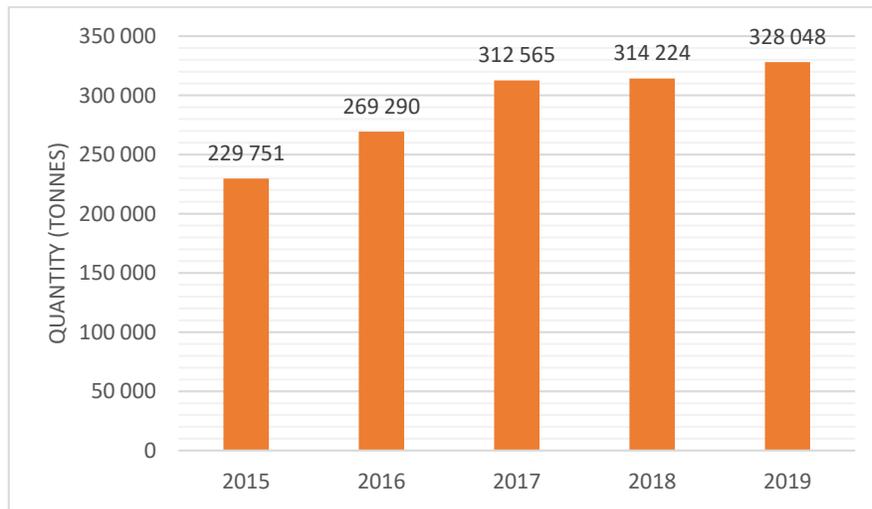


Figure 3. Poultry feed production (2015 to 2019)
Source: NAC, 2015; 2016; 2017; 2018; 2019



Figure 4. Production of feed for broilers and layers (2015 to 2019)
Source: NAC, 2015; 2016; 2017; 2018; 2019

- **Chicken production**

Industrial poultry production increased during the last five years. The total chicken meat production (broiler and culled laying hens) of 2015 was estimated at 51,845 tonnes, which comprised of 48,902 tonnes of broiler and 2,943 tonnes of culled laying hens meat. In 2016, chicken meat production was estimated at over 59,479 tonnes, of which 95% was broiler and 5% culled laying hen meat. The turnover in 2016 was estimated at over 155.1 million US\$(MEPA/DIREL, 2018; CNCR/MEPA, 2018). Between 2017 and 2018, the quantity of meat produced increased from 66,000 to 77,821 tonnes, an increase of 11,769 tonnes of poultry meat. For 2018, the financial values was estimated at 202.9 million US\$ for broiler meat and 11.7 million US\$ for culls. Chicken meat production in 2019 amounted to 78,457 tonnes of chickens' equivalent to a turnover of 216.3 million US\$for the commercial poultry sector Broiler meat largely dominated with 95% of the total production, meat from culled laying hens was only 5% of the production.

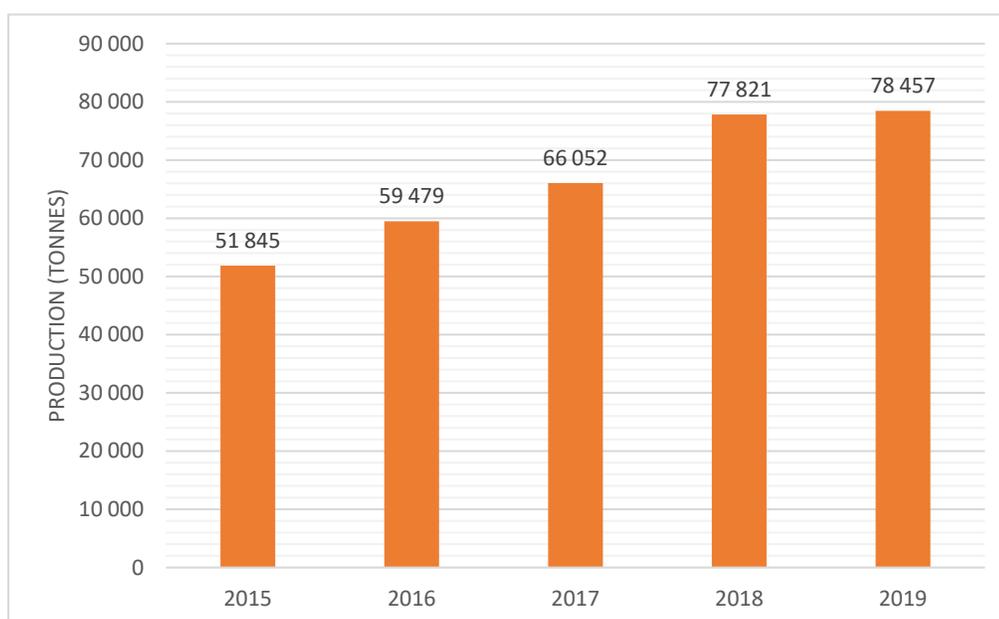


Figure 5. Poultry meat production (2015-2019)

Source: NAC, 2015; 2016; 2017; 2018; 2019

- **Production of eggs for consumption**

In 2015, the production of eggs for consumption was estimated at 514.7 million units, equivalent to a turnover of 55.6 million US\$. Production recorded an increase of 6.85% the following year (2016) equivalent to a turnover of 71.8 million US\$ (CNCR/MEPA, 2018). Production increased by 5.23% in 2017 and by 8.18% in 2018, In 2019, the production of eggs for consumption was estimated at 885 million eggs equivalents to a turnover of 95.6 million US\$ (Ly, 2020).

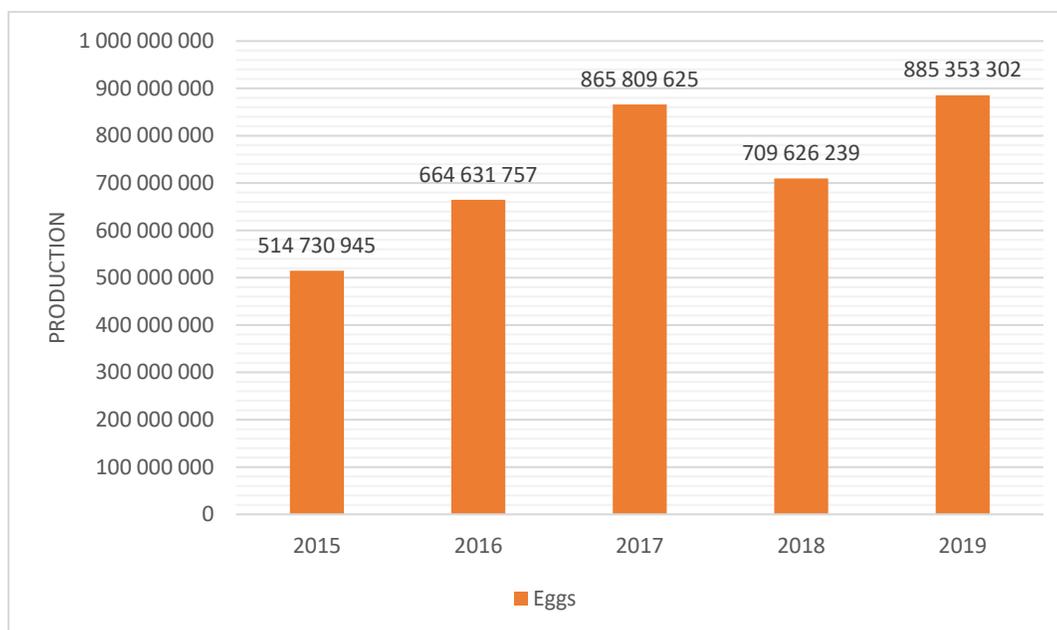


Figure 6. Production of table eggs (2015-2019)

Source: NAC, 2015; 2016; 2017; 2018; 2019

Developments in the policy environment: national, regional and international trade, investment, private sector support, food safety and animal health

The commercial poultry sector made the first institutional step forward following the threat of avian flu. In 2008, a National Plan for the Prevention and Control of Avian Influenza in Senegal (PAPLUGA) was formulated under the aegis of the National Committee for the Prevention and Control of Avian Influenza (CONAGA) created by the Ministry in charge of livestock. This led to a better study of poultry marketing in Senegal as well as the situation and characterisation of poultry farms (farms and hatcheries) on health and safety bases. A 2010-15 development plan at the request of poultry sector stakeholders (AEC, 2010) was therefore formulated. The plan recommended a better structuring of the sector with the establishment of an umbrella poultry stakeholders' organization. After a long process initiated by the Ministry of Livestock and Animal Production (MEPA) and supported by the Permanent Secretariat of the Accelerated Growth Strategy (SCA) and the Livestock Production and Animal Industries Cluster, a structuring process was launched (SCA, 2013).

In October 2012, an ad hoc committee drew up the constitution of the umbrella organization, Interprofession Avicole du Sénégal (IPAS), which was finally created in October 2013. Thus IPAS, from its creation, was able to draw a strategic plan for 2017-2023. IPAS became involved in the promotion of the poultry sector with objective set target of 517.2 million US\$ per year turnover by 2020. The scope for progression remains wide and shows how much performance could be improved in the poultry value chain. In July 2013, a ministerial technical meeting identified a set of actions to be taken for the next 10 years with five points, namely (i) creating zones dedicated to poultry farming i.e. "poultry basin of production" close to consumption markets; (ii) sanitary suspension of poultry product imports for a period of seven years (2013-2020) and strengthening of related regulations; iv) imposition of an additional tax based on the volume of imported poultry meat for a period of three years (2021-2023); v) update and complete, during the 2013-2015 period,

the regulations governing local maize production for the poultry industry in the south-east regions and facilitation of the commercial contract agreement between maize producers and feedmillers; iii) maintain the poultry sector in Senegal (AEC, 2010).

Subsequently, after the first draft in 2010, a development strategy for the poultry sector was refined in 2014 with a vision and strategic objectives of competitiveness, food and nutritional security and economic growth. In 2014, the actions towards the 2020 horizon were to "make the poultry sector an engine of Senegal's emergence through sufficient and competitive supply of poultry products, diversified and of high quality, contributing to youth employment, poverty reduction, the fight against malnutrition and the development of exports of high value-added products". Such a vision was structured in 3 strategic thrusts namely i) improving the institutional framework; ii) enhancing competitiveness and iii) IPAS support, governance, and advocacy (ACS, 2014).

From 2014 to 2021, commercial poultry farming benefited from Senegal's foreign trade policy of a "protectionist" nature with a technical barrier maintaining the import ban despite the implementation of the Common External Tariff (CET) in January 2015 and Economic Partnership Agreements (EPAs) with the European Union. However, it should be pointed out that under the framework of the Emerging Senegal Plan (ESP) and its Priority Action Plan (PAP) 2014-2018, the poultry sector has not been explicitly targeted among the priority sectors requiring direct and specific interventions by the Government.

Although the Support Project for Family Poultry Development (PRODAF) was included among the priority livestock projects in the Consolidated Investment Budget (BCI), the ministry in charge of livestock was unable to secure strategic financial resources for poultry farming. The "industrial" poultry sub-sector was included in the execution of the flagship projects, but commercial poultry was not named in the "establishment of 100-150 aggregation projects targeting high value-added agricultural and livestock sectors". The remarkable progress of commercial poultry farming, dominated by the private sector, has not led Senegalese policymakers to consider it as a priority sector which needed to be strengthened with government assistance. Government support has been limited to the reduction of VAT on some inputs of production of chickens and table eggs, such as maize, oilcakes, veterinary inputs (medicines, vaccines and premixes) and day-old chicks.

The analysis of Senegalese poultry industry's weaknesses has been done as part of the COVID-19 impact analysis (Ly, 2020), and the formulation of the Senegalese poultry farming recovery plan (MEPA, 2021). There are internal weaknesses affecting commercial poultry production resulting from protectionist policies which have hindered effective competitiveness.

Internal constraints and deficiencies have been identified as negative factors that are jeopardizing the sustainability of the emerging modern commercial poultry farming and the strengthening of its position in the consumer market for poultry products in Senegal. The main negative factors are as follow:

- Lack of a reliable information system on the mapping and characteristics of the different types of actors, production, productivity, cost of chicks, poultry meat, eggs;
- Weakness of the mode of intervention of the Department of Veterinary Services and Department of Livestock in the Ministry in charge of livestock;

- The limited presence of public and private support as well as technical-economic monitoring services for industrial and semi-intensive poultry farming;
- Lack of policy to monitor production parameters, markets, prices, imports and exports;
- Insufficient professionalization and weak institutional and organizational capacities of actors;
- Lack of hygiene control measures throughout the value chain and uncertainty of hygiene quality and traceability;
- There is no specific regulation on the establishment and operation of poultry farms and the distribution of poultry products, although the hygiene and environmental codes legislate on certain general aspects;
- Weak vertical integration between producers and industrialists, as it is generally limited to the supply of inputs or, at most, to the after-sales follow-up of farms by industrialists.

In 2021, a multi-stakeholder diagnostic and consultation process on the poultry sector was organized by MEPA in collaboration with the agency overseeing the implementation of the Plan Sénégal Emergent (BOS-PSE), IPAR and IPAS. From January 2021, a task force was put together by the Ministry in charge of livestock, with IPAS, the Poultry National Center, the department of livestock and the BOS-PSE to launch a Senegal Poultry Revival Plan (PRAVIS) in March 2021. Subsequently, four regional webinars with poultry sector stakeholders grouped into four zones³ were held to inform and involve grassroots stakeholders (regional and departmental livestock and animal production inspectors, grassroots producer organizations, private individuals, members of IPAS and the National Women's Livestock Board (DINFEL) in the validation process. The regional meetings were well attended and allowed for exchanges between the various regional actors, as well as between MEPA's central services and actors at the regional level. The IPAR contributed to the appropriation of the Revival Plan at the grassroots level and the dissemination to national actors. The process finally led to consensual adoption of the PRAVIS, which was presented by the Minister in charge at the Council of Ministers on 28 April, 2021⁴. The implementation of this plan became effective and a part of the indicators of the scoreboard prepared by the BOS/PSE for each Council of Ministers for the execution of flagship projects and reforms of the PES (poultry and milk component).

In June 2021, IPAS held its Ordinary General Assembly in order to contribute to the implementation of public policies in the poultry value chain in Senegal. As such, IPAS, which was the first officially recognized umbrella body in the livestock and crop sectors in Senegal since May 2021, became fully eligible for the collection and redistribution of funds within the framework of the National Fund for Agro-Sylvo-Pastoral Development (FNDASP). From then, in the application of the Agro-Sylvo-Pastoral Orientation Law, the IPAS could, together with the government put into action mechanisms to collect proceeds from domestic and international commercial transactions and set up mechanisms of refinancing, redistribution and structuring of investments dedicated to the poultry sector.

³ March 23, 2021, Southern and Eastern zones (Tamba, Kolda, Sédhiou, Ziguinchor); March 26, Central zone (Kaffrine, Kaolack, Fatick, Diourbel); March 30: Thiès, Dakar zone; March 31, Northern zone (Saint-Louis, Matam, Louga)

⁴ <https://www.sec.gouv.sn/actualité/conseil-des-ministres-du-28-avril-2021>

Ease of doing business

With a growth rate of over 5% for the period 2014-2019, Senegal is one of the most dynamic countries in sub-Saharan Africa (World Bank, 2020). Although the COVID-19 crisis affected economic activities and caused a regression in GDP, a growth of 5.2% was expected for the year 2021⁵. However, Senegal's poverty rate was estimated at 42.8% in 2011 and 37.8% in 2018/19 (ANSD, 2022). The country has been on the list of Least Developed Countries (LDCs) since 2000 due to a "sustained deterioration of its economic situation" (United Nations, 2016). Nevertheless, Senegal is a good investment destination due to political stability, a geographical position conducive to trade and a relatively open trade policy. However, to better encourage internal and external investments, Senegal needs to improve some factors. The Direction de la prévision et des études économiques (DPEE, 2019) reported that, depending on the economic sector, businesses complained about several constraints, namely corruption, difficulties in recovering debts especially public debts, insufficient demand, unfair competition, restrictive taxation, and difficulty in accessing land. The level of ease of doing business in Senegal with a focus on the level of access to resources and the business environment helps to describe and characterize the economic and social context of commercial poultry farming based on the last 5 Ease of Doing business reports of the World Bank Group. Thus, 10 business facilitation indicators, whose relevance and comparability make it possible to judge the reforms undertaken by 190 countries to improve the business environment and encourage entrepreneurship were considered. Such an approach applied to Senegal's commercial poultry industry would help in the identification of the factors promote the poultry sector and the modalities and requirements for a favorable evolution.

Access to resources: land, capital, genetics, food and know-how

Access to resources for commercial poultry farming is differentiated according to the resources considered.

- **Land**

Like all peri-urban economic activities, peri-urban land is subject to very strong pressure and competition for purposes that are not for housing, the expansion of old neighborhoods and the occupation of new neighborhoods through public or commercial housing developments. Land tenure remains among the major problems for commercial poultry farming that is mainly located where land access issues and conflicts are the most acute in Senegal. Many poultry farms are caught in a pincer movement by the expansion of housing and their precariousness is obvious. Communal territories are extended based on deliberations by decision-makers who are subject to pressure from their past or potential constituents. As it is elsewhere, in Senegal, many occupations are the result of customary and informal occupation arrangements and are not protected by durable land rights such as land titles in the name of the farm owners.

⁵ <https://www.tresor.economie.gouv.fr/Pays/SN/indicateurs-et-conjoncture>

- **Capital**

Poultry farming is not immune to the general credit situation in Senegal. The traditional banking system is not very favourable to livestock activities because of health risks and the lack of understanding of livestock activities by credit services that are strongly oriented towards trade, the tertiary sector and consumer credit. The credit situation is more precarious as the insurance sector is almost absent from the livestock sector.

- **Genetics**

Access to chicks is easy as a result of activities of the network of breeders, breeders who produce locally and hatching the eggs, and breeders, who hatch imported eggs. This network is very concentrated in a region, but ensures a distribution of chicks despite seasonal disturbances related to a demand which can be erratic. The chicks are distributed without great difficulties, taking advantage of road networks which has improved relatively over the last 5 years. The relocation of commercial freight from Dakar airport to Ndiass airport, which is an airport hub, has made importation and dispatching easier.

- **Feed supply**

The dependence of commercial poultry farming on imported maize is one of the main obstacles to the competitiveness of commercial poultry farming. The local maize market is not very well connected to the demand for poultry because the maize production areas in Senegal are far from the poultry production areas. In addition, the maize sector is still in its infancy in terms of production, organization and execution of contract agreements with the poultry sector.

- **Know-how**

Senegal has good expertise in poultry farming that stems from a long tradition of poultry training through the National Poultry Center in Mbao, poultry projects and mechanisms to promote youth and women's employment by NGOs. Since 2017, training activities under the Poultry Cluster instituted by the Ministry of Vocational Training, IPAS and MEPA had trained nearly 840 intermediate level poultry farmers. Thus, poultry know-how is a recognized factor of emergence. In addition, the proximity of the LNERV (National Laboratory for Livestock and Veterinary Research) and the EISMV (Inter-State School of Veterinary Science and Medicine) allows for the existence of a proper network of technical and veterinary supervision and health monitoring, which is reinforced by the private veterinarians who are very present in the poultry areas of Dakar and Thiès.

In addition to these intrinsic characteristics of the poultry sector, Senegal's business environment has a configuration and evolution that strongly influences commercial poultry farming. The general business environment contributes strongly to the performance of commercial poultry farming because it affects first the formal sector of which commercial poultry farming is a component.

Business environment

The evolution of Senegal's "Doing Business" score over the last 5 years showed that the country is gradually improving its business environment (The World Bank Group, 2016a, 2016b, 2018, 2019,

2020). Figure 7 shows the increasing trend. The 2020 Doing Business ranking gave Senegal the 123rd position, with an improvement of 18 places from the previous ranking. According to the government, four major reforms explained the improvement: "the separation of tax payment and declaration procedures, the reform of taxes on the contribution to the local economy, the reform of the Commercial Court and the reform of investor protection"⁶. Regarding the "Doing business" indicators, efforts were mainly observed on the score for obtaining a loan, which rose from 30 to 65 from 2019 to 2020. The score related to the payment of taxes also increased from 48.1 to 51.2. The evolution of the business environment in Senegal can be analyzed according to the conditions resulting from the major reforms applied by Senegal over the last 5 years.

Ease of business creation: Facilitating business creation encourages the strengthening of a formal sector of the economy. This indicator integrates the costs related to business creation (minimum capital, creation fees etc.), but also the number of steps and the duration of the procedure. Senegal is ranked 60th out of 190 evaluated countries in the world (Report "Doing business 2020"). Nevertheless, over the period 2015-2017, this indicator was unchanged. The increase of 3 points observed in 2018 resulted from reforms which reduced notary fees for the creation of a company. In addition, Senegal lowered the minimum capital requirement for business start-ups in 2015 and again in 2016.

Commercial poultry farming is generally under the legal regime of enterprises, but it should be noted that in Senegal the informal sector is very important and even dominant in most production and commercial activities. This criterion is important for large enterprises, especially hatcheries and feedmills, and to a certain extent for technical and veterinary service providers, but production and marketing are still largely dominated by the informal sector, which was affected, for the time being, by the reform aimed at facilitating the creation of enterprises. The implementation of PRAVIS will certainly change this situation, as one of the priority programmes will be the identification of actors, their mapping and monitoring, which will necessarily lead to a minimum of formalization. This formalization will undoubtedly be facilitated by the ease of business creation.

Electricity connection: The electricity connection indicator considers the costs and time required for a business to gain access to electricity. Access to electricity is one of the major problems for entrepreneurship in sub-Saharan Africa, despite its enormous energy potential. However, Senegal has made considerable efforts over the period 2015-2020, with the indicator rising from 25 to 65. This was mainly due to improved data management related to power outages, with the recording of data related to the annual average system interruption duration index and the average system interruption frequency index. In addition, Senegal reduced the price of electricity in 2016 with the reduction of the security deposit.

Given that electricity is an essential production factor in commercial poultry farming, to guarantee production performance and the possibility of processing and adding value to the products, the facilities connected to electricity in peri-urban areas and areas where commercial poultry farming are concentrated have played a key role in the expansion of commercial poultry farming, the diversification of actors and the modernization of technical itineraries (hatching and hatcheries,

⁶<http://www.big.gouv.sn/index.php/2019/10/25/doing-business-2020-le-senegal-gagne-18-places/>

chick management, poultry breeding techniques, slaughtering and plucking, storage and cold chain, cutting, marketing, etc.).

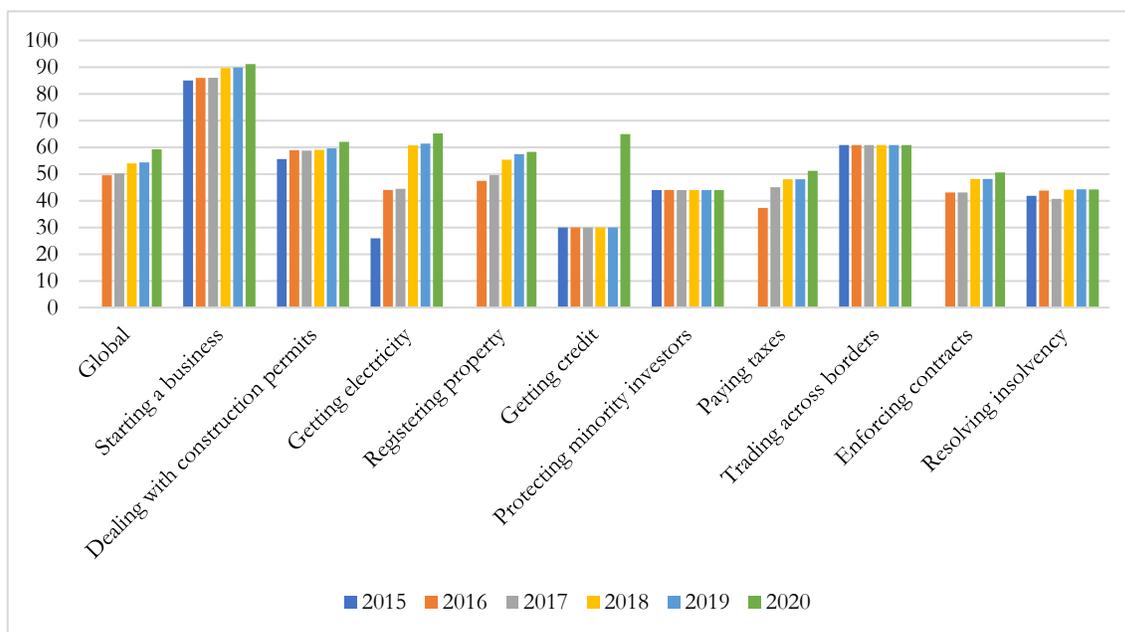


Figure 7: Evolution of Senegal's doing business indicators over the period 2015-2020
Source: World Bank open data; authors' calculations.

Transfer of ownership: This indicator relates to the ease of registering title to property and incorporates the number of steps, duration and costs associated with registration and transfer. Ease of access and transfer of ownership reassure investors. This indeed represents a guarantee of long-term investment stability. Thus, in 2019, Senegal reduced the time needed to transfer and register property, allowing the score to increase from 55 in 2018 to 57 in 2019. In addition, Senegal reduced the costs of property transfers and registrations in 2018, allowing this indicator to increase from 49 to 55 from 2017 to 2018. In 2017, improvements in the transparency of the cadaster also made property registration processes more efficient. Finally, in 2016 Senegal also lowered the property transfer tax, which reduced property transfer costs. Although important for the business environment, this criterion has a limited impact, as does the criterion of facilitating business creation.

Obtaining loans: Access to credit is an important aspect of the business environment, as it solves the problem of access to financing for entrepreneurs. Thus, this indicator gives the transparency of credit information and the rights of debtors and creditors, but also the reliability of collateral and the coverage of the credit registry and bureau. Senegal's ease of obtaining loans indicator was equal to 30 and stagnated over the period 2015-2019. In 2020, with improved access to credit information, this score increased to 65, allowing Senegal to be ranked 67th in the global ranking.

Tax payment: The tax payment indicator refers to the number of taxes that firms must pay, the costs of paying taxes, the time it takes to pay taxes etc. The ease of paying taxes is indeed a significant factor in the ease of doing business. Ease of tax filing and payment saves time and compliance costs for businesses, thereby promoting tax compliance and reducing informality. In

2020, with the dematerialization of tax declaration and payment, and the consolidation of several taxes, improved Senegal's tax payment score. In 2018, a VAT-related reform consisting of the reduction of the processing time for cash refunds of VAT credits also improved the business environment in Senegal. The refund of VAT credits is one of the major problems faced by African businesses, especially exporters as regards taxation. In 2017, the tax payment score improved from 37 to 45, as a result of reforms linked to the reduction of the corporate tax ceiling and the implementation of more efficient accounting systems and software. In 2015, Senegal was thus able to improve tax payment procedures, including VAT, by allowing online downloading of forms and abolishing the tax on vehicles.

Enforcement of contracts: This indicator includes the time and cost (as a percentage of the claim) for settling commercial disputes, but also the quality of a country's legal procedures. The regulation of contract enforcement mainly determines the level of trust given to a country's law by investors. In 2020, Senegal improved the dispute resolution process by regulating mediation as a dispute resolution mechanism. In addition, Senegal's score on contract enforcement increased from 43 in 2017 to 48 in 2018. This increase was mainly due to the modification of the preliminary hearing rules, which facilitated the resolution of commercial disputes. The introduction of a law regulating voluntary mediation in 2016 has improved contract enforcement.

Insolvency resolution: The insolvency resolution indicator has remained fairly stable over the past 5 years. Nevertheless, Senegal has introduced reforms that have improved the insolvency resolution process, including the new conciliation procedure for companies in financial difficulty and a simplified preventive resolution procedure for small companies.

In terms of ease of doing business across borders, protection of small shareholders, and ease of obtaining construction permits, Senegal's score has remained stable over the past 5 years.

Drivers of Success for Commercial Poultry Businesses Over Five Years: An Analysis of Farms Case Studies

Presentation of individual cases

The previous analysis showed that Senegalese poultry farming was dynamic and expanding. Between 2015 and 2019, chicken meat production increased by 51%, from 51,845 to 78,457 tonnes. In 2019, the production of eggs for consumption was 885.3 million units against 514.7 million in 2015, a growth of 72%. In addition, the poultry sector and related activities attracted a lot of private sector investments. The poultry sector also created many jobs. The number of direct and indirect jobs created by the sector was estimated at 30,000 in urban and peri-urban areas (Fall, 2020). The poultry sector is a means of combating poverty, as it directly and indirectly provides income to underprivileged population, particularly in rural areas. To date, several factors have enabled the sector to develop. This section looks at the drivers of growth in commercial poultry farming.

Description of the commercial farms

The survey of commercial poultry production farms was conducted from September 11 to October 26, 2021. A total of ten farms were targeted in the Dakar and Thiès regions (Figure 1). The sampled units were of the category of "modern or industrial poultry farm" in terms of technical and commercial characteristics and whose purposes were to be a productive investment and reinvested

capital. Most of the enterprises were in the Niayes area, which is the most favourable area for poultry farming in Senegal, notably because of its climate and its proximity to the country's largest urban centres. The maps (Figures 8 and 9) illustrate this proximity with a representation of the major urban centres and therefore the most important markets for poultry farmers. Table 1 presents the ten sampled farms with their characteristics and location, as well as the production techniques used and their marketing strategy.

Most of the sampled farms were technically from the last generation type with modern buildings, natural ventilation and built according to international standards. The other sampled farms were built with fully automatic ventilation systems. Of the ten firms interviewed, only 3 were established before the 2005 import suspension measure, farm n°1 and n°8 were established in 1985 while n°9 was established in 1998 (Figure 2). Apart from farm n°5 which had been in operation for nine years, the other farms had been in operation for between two and six years. Also, 90% of the latest generation of poultry farms were located in the Thiès region (in the communes of Notto Gouye Diama, Diender Guedj and Keur Moussa) where land was more available than in the Dakar region. Poultry farms were therefore relocating to the Thiès region, where the new industrial poultry production basin of Senegal is located. All the enterprises had a formal legal status as at the time of the survey. Two enterprises (n°1 and n°9) were registered by individuals as SARL (Appendix 3) and Sole Proprietorship. The other enterprises were owned by several shareholders and registered as a Limited Liability Company (LLC). Only one shareholders' company was present in the sample as company n°7 specialized in table eggs production, with a turnover capacity of 65,000 laying hens. Thus, the limited liability company is the most frequent legal form. This has the advantage of limiting risk for the shareholders, as their liability is limited to their contribution. In addition, the formation of a SARL is less restrictive, with a minimum share capital requirement of 1,800 US\$ compared to 18,100 US\$ for the SA (Limited Company)(APIX, 2015).

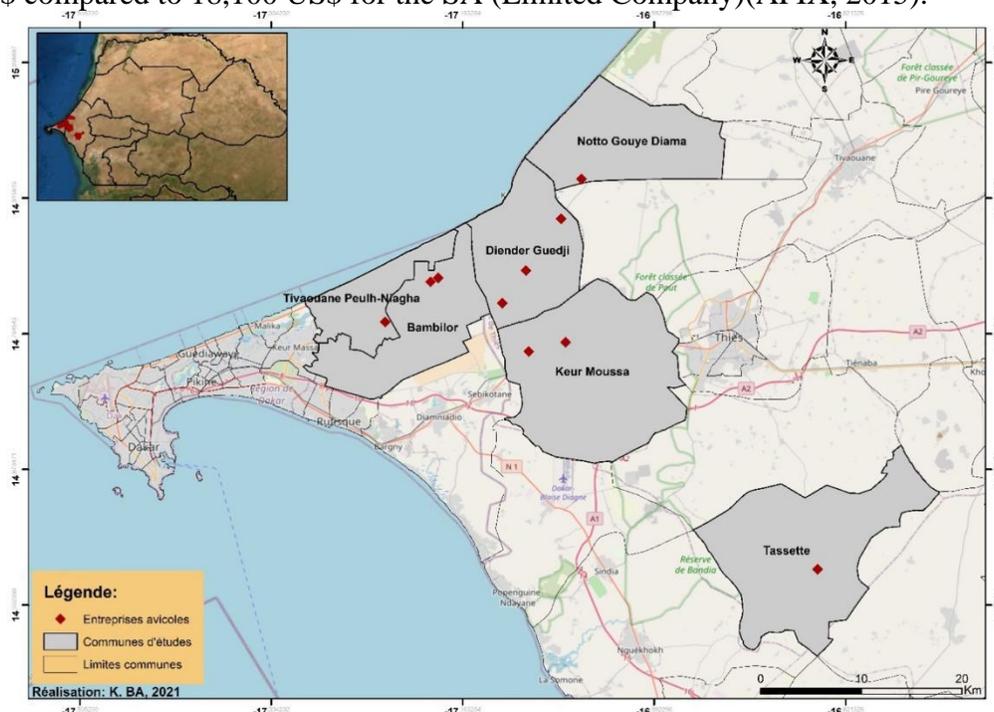


Figure 8. Location of the poultry enterprises interviewed
Source: Ba, 2021

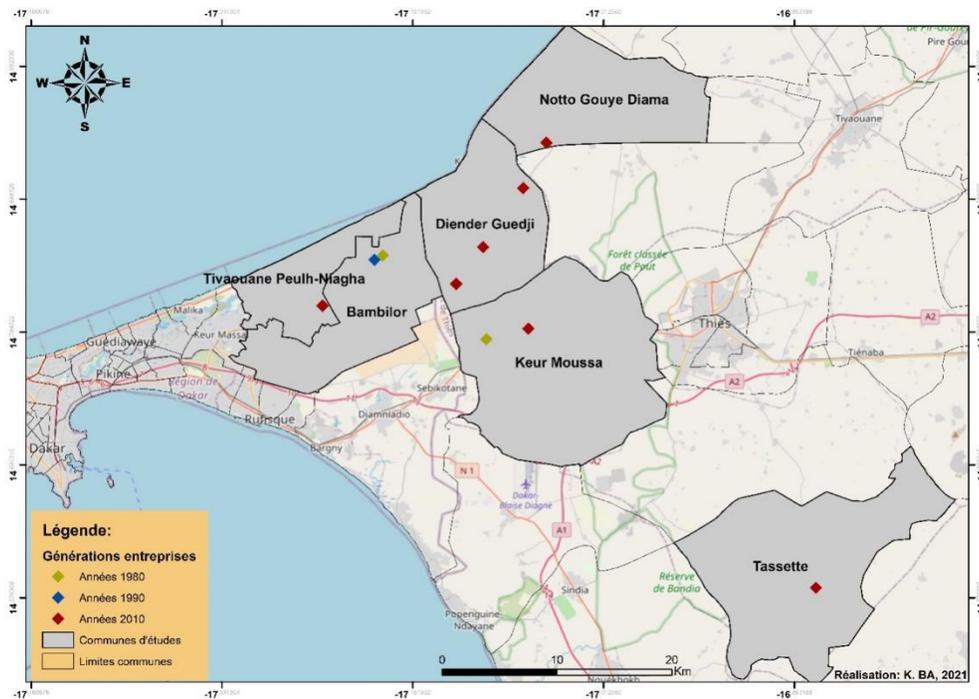


Figure 9: Year of creation of poultry businesses interviewed
Source: Ba, 2021

The activities of the respondent farms were quite diversified. Three farms specialized in broiler production and three in egg production. The other farms combined both, three farms specialized in broiler and layer production and one focussed on pullets ready to lay and broilers. They therefore, had a diversity of production models with the possibility of combining the different products of the poultry industry. This allowed the companies to diversify their investment portfolio. In the same logic, poultry farming could be the main or secondary activity of the companies in the sample (Table 1). Thus, seven farms interviewed had poultry farming as their main activity while they were engaged in other agricultural activities and three had poultry business as secondary activity.

It should also be noted that most of the farms with poultry as their main activity had secondary activities. The latter consists mainly of tree farming, dairy production, market gardening, installation of poultry buildings, and the sale of poultry equipment and feed. Two farms interviewed had poultry farming as a secondary activity. The owners of the farms owned a construction company that financed their poultry business. The second farm, which had poultry farming as a secondary activity, and mostly owned by a telecommunications engineer. Company n°7 is the only one which had poultry farming as its sole activity.

Mixed finance model was noted for the respondents. Most of them had a combination of equity and bank loans. Only three enterprises were satisfied with financing their operations with own funds, which comes essentially from their main activities and savings. Organizational support, particularly contract agreement with large integrated companies in the sector (e.g. SEDIMA), was common to several companies in the sample (90% of the poultry companies surveyed). The partnership involved supply of inputs, marketing, technical support, financing etc.

Table 1. Description of farms interviewed

Company name	1	2	3	4	5	6	7	8	9	10
Municipality	Keur Moussa	Notto Gouye Diama	Tivaouane Peulh-Niagha	Diender Guedji	Diender Guedji	Keur Moussa	Diender Guedji	Bambilor	Bambilor	Tassette
Creation	1985	2018	2015	2019	2012	2017	2016	1985	1998	2018
Status	SUARL	SARL	SARL	SARL	SARL	Sole proprietorship	Limited company	SARL	Sole proprietorship	SARL
Place of poultry farming	Main activity	Main activity	Main activity	Secondary activity	Main activity	Main activity	Main activity Single activity	Secondary activity	Main activity	Main activity
Secondary activity	Milk production	Fruit trees	Market gardening	Construction	Poultry buildings & equipment sales	Fruit trees	None	Tele-comms	Poultry equipment sales Poultry feed sales	Fruit trees
Type of production	Mixed (meat and eggs)	Mixed (meat and eggs)	Laying hens	Broilers	Mixed (Broilers and laying hens)	Broilers	Laying hens	Laying hens	Mixed (meat and eggs)	Broilers
Number of employees	9	11	5	4	26	5	18	10	13	10
Source of funding	Own funds Bank loans	Own funds	Own funds	Own funds	Own funds Bank loan	Own funds Bank loan	Own funds Project State	Own funds Bank loan	Own funds Bank loan	Own funds Bank loans
Marketing	Bana-banas Individuals	Modern slaughterhouses Bana-banas	Bana-banas	Modern slaughterhouses	Modern slaughterhouses Egg producers	Modern slaughterhouses Bana-banas Individuals	Bana-banas Large surfaces	Bana-banas Shop-keepers Markets	Bana-banas	Modern slaughterhouses
Future of the business	Uncertain	Assured	Assured	I Assured	Assured (cf profitable investment)	Assured	Assured	Uncertain	Uncertain	Assured

cf: Surveys of ten farms by the authors

Performance and production techniques of companies

It should be noted that the production capacity of the farms had changed significantly since the commencement of their poultry production operations and marketing activities. Figure 12 shows the evolution of the production capacity per rotation of the sampled farms for meat and egg products. The production capacity per rotation was determined by the level of investment of the farm. Investments (buildings, materials, and equipment) allowed the farms to improve their production capacity, but did not necessarily determine the number of rotations and therefore the actual production. Thus, to estimate the evolution of farm investments, it was necessary to start from the production capacity per rotation. An increasing trend in farm investments was observed over the duration their operations. However, an exception was observed for the laying hen sub-sector between 2007 and 2008. Farm n°8 reduced its production capacity per rotation from 45,000 to 20,000. This company had faced a crisis in 2007 caused by market saturation and diseases that led to a high mortality rate.

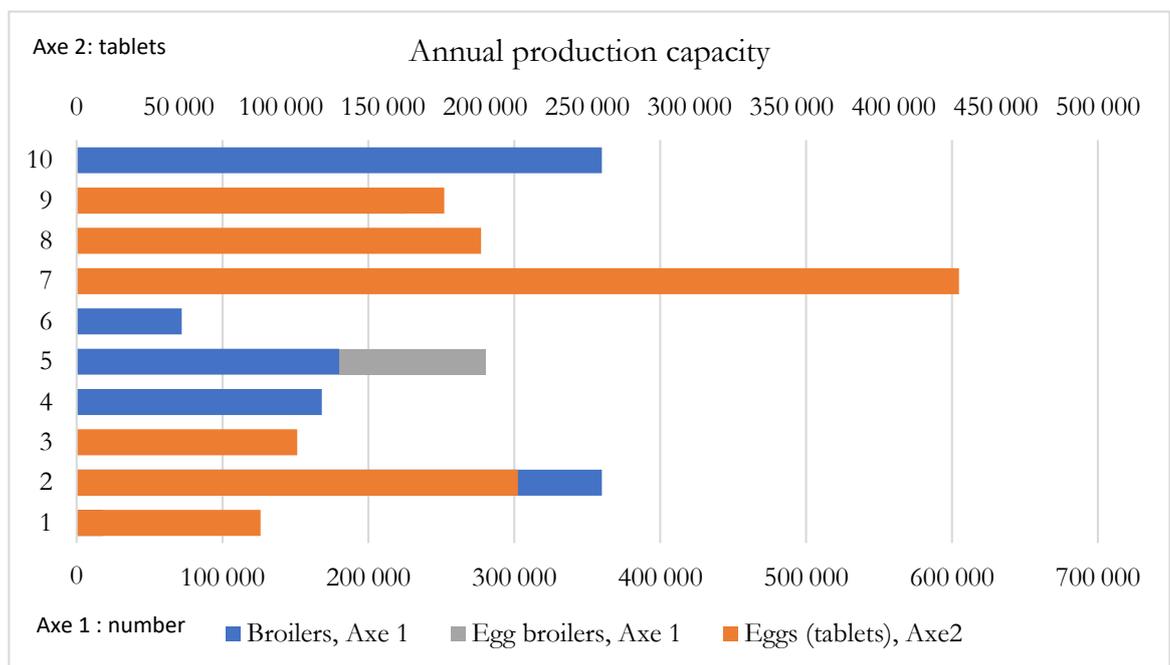


Figure 11: Annual output in 2021
Source: Authors' calculations

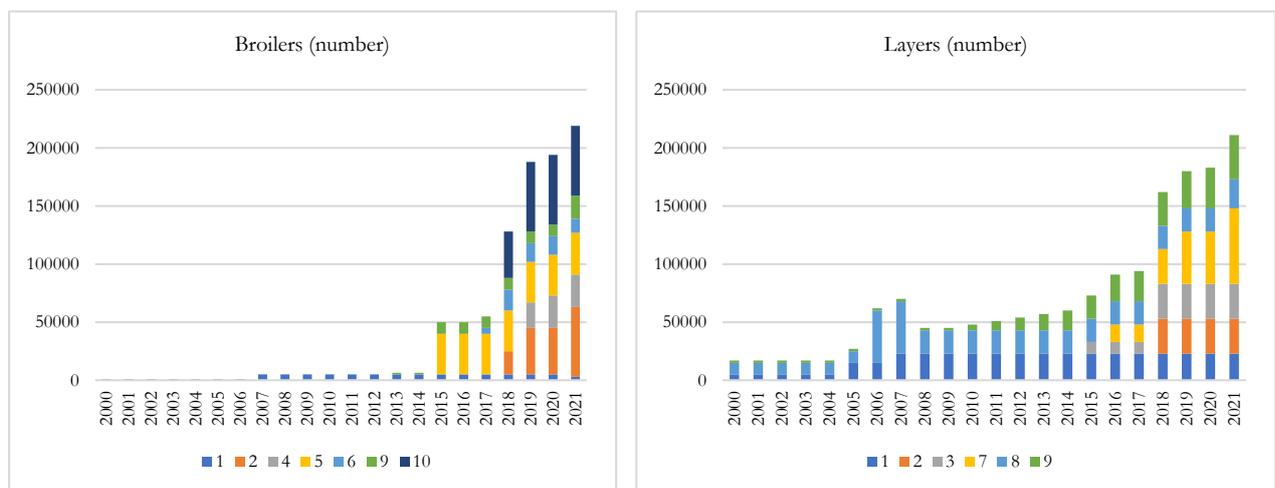


Figure 12 Changes in cycle production capacity by firm since inception
Source: Authors' calculations

Selling prices varied greatly among the farms interviewed and even within the same company. The edge-of-field price of a kilogram of live broiler chicken was between 1.72 and 2.06 US\$ from 2020 to 2021. The gap was wider for the egg production sector, with the field price of a tray of eggs (30 pieces) varied between 3.10 and 3.96 US\$ over the same period, compared to 1.72 to 2.24 US\$ which was obtainable during a period egg glut between 2016 and 2018, and consequently, prices fell sharply. Between 2012 and 2013, several businessmen had invested in the poultry sector, particularly in egg production. Egg production peaks were associated with a significant peak in egg production at SEDIMA. As a result, supply was much higher than demand and many producers went bankrupt because of their poor sales. The egg market is very volatile in Senegal. Egg price is highly dependent on supply and falls sharply during periods of over-production, this situation is aggravated by the lack of adequate or sufficient storage facilities. There have been periods of low production which resulted in significant price increase. Chicken meat is more stable, even though there were price differences from one farm to another. It should also be noted that price of the same product varied sometimes within a farm, price was determined according to the demand and supply forces of the market. Prices also varied according to the live weight of broilers.

The average price for broiler chicken offered by slaughterhouses varied between 1.89 and 1.94 US\$ per kilogram live weight. The average target weight varied between 1.8 and 2.2 kg, after dressing, carcass weight varied between 1.3 and 1.5 kg. The frozen dressed birds were thereafter moved to supermarket for distribution.

The production performance, the quality of the products supplied, as well as the prices of the output depended essentially on the price and quality of the inputs used by the farms. It should be noted that the farm managers/owners all claimed to have had difficulties in procuring inputs, especially with costs and quality. The farms also claimed that the quality of poultry inputs were not always guaranteed, both for poultry feed and the chicks. The chicks were sometimes poorly sorted. No poultry farmer reported being completely satisfied with the quality of inputs provided by suppliers.

Technical support was an important factor in poultry business, as it allowed stakeholders to limit the risks of contamination and increase their production performance. Therefore, managers/owners were asked to assess technical support received from input suppliers. Most of the farms considered technical support crucial for good production performance and stated that they were satisfied with the technical support received from their suppliers. However, insufficient veterinary services and non-thoroughness of the support received were the main constraints.

The farms had various types of techniques and channels and also combined several strategies for marketing (Table 1). Most farms interviewed marketed their products through bana-banas (7 of the companies) for eggs and broilers. Some farms sold their products to modern slaughterhouses, notably those of SEDIMA and AVISENEGAL (5 of the farms). Some producers sold directly to individuals, markets and shopkeepers (4 of the farms). One of the farms sold some of its eggs to large-scale retailers.

The companies reported some difficulties in their production operations. The main constraint reported was management of numerous diseases which the farms were exposed. The difficulty of access to inputs, particularly price, and the quality of the inputs also constituted obstacles to the expansion of the poultry industry. The high price of inputs reflected in production costs, making farms less competitive. Managers/owners pointed out the uncertainties of marketing contracts that were suddenly broken by partners and disrupting production activity. Market saturation was also mentioned. When supply exceeded demand, poultry farmers experienced

poor sales or drastic drop in selling prices. Other difficulties encountered by poultry farmers included power outages, lack of insurance packages for the poultry industry, access to water etc. However, despite these difficulties which hindered their growth, several factors enabled the businesses to succeed.

Key success factors of companies

The key success factors of the farms interviewed can be classified into four main categories: production technology, management, demand and government policy. Production technology efficiency referred mainly to investments and innovations, access to inputs, cost savings, financing models, but also contract agreements and organizational support that involved in sales and input acquisition or financing. Management refers to the management of the farm operations and management of staff, capacity building and training to improve the efficiency of the workforce. Demand refers to production outlets, customer management and marketing channels. Government policy refers mainly to the fiscal and trade measures that have been put in place to promote the expansion of the domestic poultry industry. Figure 13 summarizes the key success factors highlighted by the managers/owners of the farms interviewed.

Nevertheless, it should be noted that the key success factors were not of equal importance for all farms. Therefore, the first, second and third key success factors of each farm can be highlighted and ranked according to their level of importance for the ten farms in the sample. Figure 14 ranks the key success factors according to their level of importance and frequency determined as the number of farms reporting it at a given level. For example, import suspension measures, personnel and company management and increased demand were each the top key success factors for two companies. Access to equipment and customer loyalty were each the first key success factor for three farms. Support from suppliers such as SEDIMA and improved production performance were highlighted as the second key success factor for two companies. Finally, access to financing and equipment, as well as customer loyalty were cited as the second key success factor by three companies. At the third place, access to financing was the most cited among the businesses in the sample



Figure 13: Key success factors for companies

Source: Authors' calculations

Management was cited as the primary determinant of success in the sampled companies. Some farms relied first on skilled labour and then on employee training, close management and employee motivation to improve efficiency. As an example, one farm reported paying salaries early to encourage employees. Management was followed by organizational support, particularly from SEDIMA, which intervened at all stages of the chain. The integration contracts with SEDIMA allowed farms to spread risks. The farms also benefited in form of technical support and even financing. Access to financing and equipment were also determining factors in the expansion of the farms interviewed. Financing allows farms to increase their investment and therefore their production capacity per rotation. Quality equipment allowed for greater productivity of the business. In addition, increased demand and customer loyalty helped businesses to avoid sales shortfalls. Given the storage failures observed in the sector, securing outlets was a crucial factor that determined the turnover of farms. Thus, most of the success factors were cited by several enterprises, which highlighted similarities of the production units in the sample. However, participation in a professional organization was only mentioned by one farm as a success factor. Most of the companies pointed out the inefficiency of these organizations and some even ignore their existence.

Discussion of results: Cross analysis of key hypotheses to be tested.

The above developments made it possible to present the characteristics of the farms in the sample and the key factors of their success. For each hypothesis formulated, answers must be obtained from the survey results, but also from literature and the analysis of the Senegalese poultry industry presented above. These hypotheses are related to the factors that have enabled Senegalese poultry farming to develop. For example, were risk mitigation, government trade policy, market size, increased demand, the development of fast-food chains, urbanization, difficulties in importing eggs for consumption, the determining factors in the development of the Senegalese poultry industry, and to what degree?

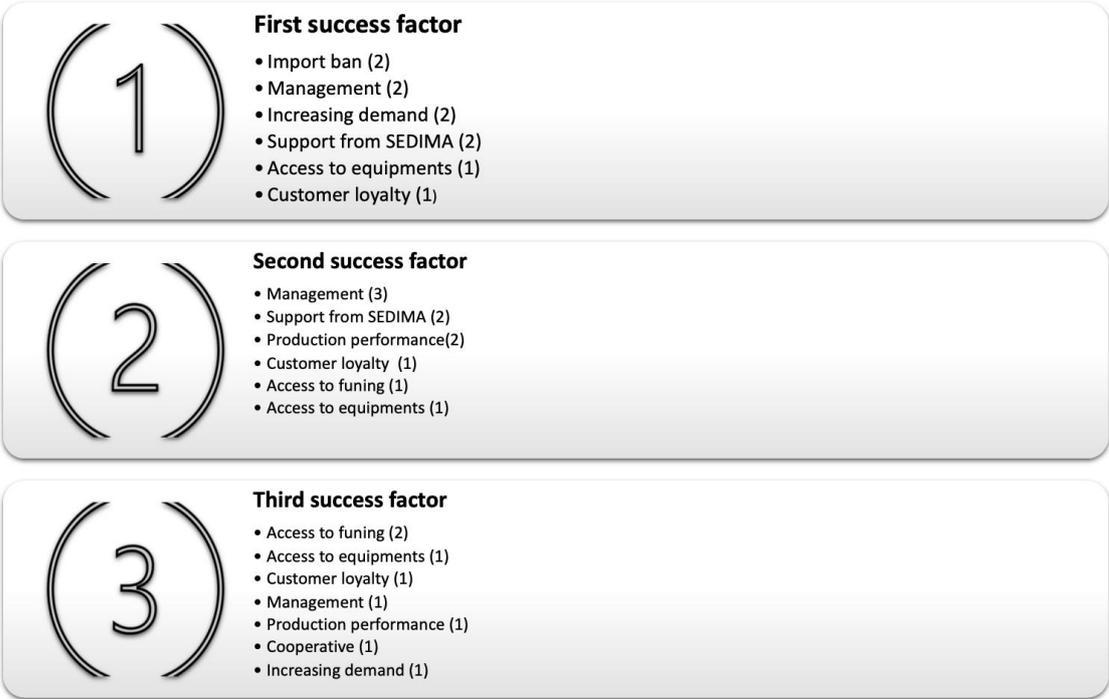


Figure 14: Ranking of key success factors for companies
Source: Authors' calculations

Hypothesis 1: Multiple risks affect the viability of investment in commercial poultry enterprises. The ability to mitigate these risks is a key determinant of private investment.

The survey showed that Senegalese poultry farming was exposed to several risks: diseases, which were the main cause of mortality, fluctuations in the prices of finished products and inputs etc.

As a result, farms were implementing various strategies to mitigate these risks. Some companies enrolled their staff in training courses at the National Poultry Centre (CNA) to strengthen capacity and reduce the risk of poor management. Contract agreements with organizations was also a strategy applied by companies to better spread their risks. Integration contracts were implemented to secure the entire production stage which allowed producers to benefit from rapid and adequate support throughout the process. However, this strategy sometimes increased the risks according to some companies. The organization with whom they had contract agreements adjusted prices of inputs supplied while the purchase price of the products they received from the producers remained unchanged. It was also reported that they disrupted the contract and caused producers to lose their main outlets. To mitigate these risks, companies invested in securing their customers and guaranteed outlets for their products. This allowed them to reduce the duration of production/feeding and the risks of poor sales. Thus, the ability to mitigate the many risks that threaten the Senegalese poultry industry makes the difference between commercial farms in terms of the profitability and success of their activities.

Hypothesis 2: Protection from foreign competition through tariffs or sanitary barriers (e.g., avian flu) influenced foreign and domestic investment in the poultry sector.

It is reported in literature that the development of Senegalese poultry farming depends significantly on the government's trade policy. In 2005, the suspension of importation of poultry products due to avian influenza, which has been contained, led to an impressive development of the sector. On the other hand, the decrease in customs duty caused by the application of the WAEMU (UEMOA) Common External Tax (CET) which lowered the rate from 55 to 20%, caused the disappearance of 75% of poultry farms in 2000. The import tariff reduction resulted in surge in imports with the disappearance of 70-75% of poultry farms when applied (Duteurtre *et al.*, 2005; Pigeaud, 2003). Thus, the sector depended on imports of poultry products, especially poultry cuts, which were sold at very low prices. Indeed, the low purchasing power of households made price one of the primary determinants of their consumption choices. The suspension of imports therefore led to an increase in investment in the poultry sector in which has resulted in improved performance and production.

Among the farms in our sample, three existed before the suspension of importation, and they were able to take advantage of this measure to improve their production. After the application of the measure, company n°1 increased its production by 200% between 2000 and 2005, while company n°8 increased its production by 350%. Company n°9 produced 2000 laying hens per year in 1998. In 2010, its production increased by 3000 laying hens per year. Nevertheless, the companies that were established after the import suspension measure also felt the positive effects of this policy which expanded the sector.

Several actors claimed that the Senegalese poultry industry will encounter the same difficulties as it did after the application of the CET if importation of poultry cuts is allowed again. They believed that the differences in price between imported products and locally produced products were too wide. Some companies already described the the future of their business as uncertain. Another reason cited for the uncertainty of the future of their companies was the lack of involvement of their offsprings and fear of succession. These are in addition to market

saturation (glut) challenge. They also mentioned that the possibility of lifting the ban on importation may compel them to halt investment in the poultry business and diversify their investments in other agricultural activities. Finally, apart from government's trade policy and the tax policy, exemptions on the purchase of equipment and- poultry sector inputs resulted in reduction in production costs and thus improved the performance of poultry farms.

Hypothesis 3 and 4: Domestic market size and expected demand growth (both populations increase and per capita income growth) as well as the growth of the urban middle class with associated change in consumption are essential for profitable investments – Poultry investments are growing in close interaction with the expansion of the fast-food chain, mainly in urban areas.

Other Hypotheses to be tested concerned demand and production outlets. Increased demand has been an important determinant of the expansion of commercial poultry production in recent years. The survey results confirmed this hypothesis. The interviews indicated that increased demand and changing dietary habits contributed significantly to the success of the Senegalese poultry industry (owner of farm n°1).

The partners of company n°7 stated that they started producing eggs for consumption after a market study showed high demand for eggs in Senegal. The company also stated that due to the high demand, it had no difficulty in selling its products and planned to increase its production capacity to meet the gradual increase in demand for table eggs. Company n° 8 confirmed this notion by stating that its first key success factor was the size of the demand which created a financially rewarding market which made disposal of eggs and broilers chickens easy

As noted above, the increase in demand was mainly due to the change in consumer eating habits, and increased reliance on fast food. One must note the expansion of franchised "Kentucky Fried Chicken" and "Djoloff Chicken" outlets in Dakar. In addition, the formation of large urban centres is creating significant opportunities for poultry production.

Hypothesis 5: Large-scale investments in poultry production which incorporates backward integration and forward linkages in feed mills, day-old chick production, slaughtering, and marketing have higher success rates because they can mitigate many otherwise risky supplier and customer dependencies.

One of the reasons for the lack of competitiveness of commercial poultry farming is the lack of integration of the value chain. The Integration allows firms to achieve economies of scale that lower production costs. Lower production costs then allows firms to lower their selling prices or increase their margins. However, the integrated companies could not be included in the surveys because of the difficulty of accessing their management⁷. The farms interviewed were those engaged in poultry production. Nevertheless, the problems posed by integrated companies emerged during the interviews. Integrated companies supply other companies with inputs but also compete with lesser companies at the production stage, thereby remaining more competitive. Company n° 3 emphasized that despite their valuable technical support, input suppliers remained major competitors, as they had taken control of the table egg market. The subsequent request made is that these big players in the industry should limit themselves to input supply, advice and processing. This suggestion led to strong policy recommendations to establish independent mediation mechanisms to ensure fair play between poultry farmers and large integrated companies and to have an effective antitrust law to avoid anti-competitive

⁷ A restitution is planned with stakeholders to get additional opinions from them

practices and the abuse of a dominant position in the poultry industry so that integration becomes smoother.

This raises an essential question: what is the future for semi-intensive and extensive production units with the development of integrated poultry farms? The productivity gains which results from integration increase the productivity gap between large and small firms, which may cause a decline in the activity of small and medium-sized farmers who become less competitive. The integrated companies offered contracts to most of the farms sampled. The farms interviewed reported lack of negotiating leeway on their part with the integrated companies during contracts negotiation and implementation which- hurt their production performance.

Ultimately, integrated chains allow the development of the industrial sector, because they have better production capacities and produce at lower prices. However, such an assumption must be put into perspective because integrated chains also pose threats to their downstream customers who are highly dependent on them and have no real bargaining power. Such a situation is perceived as a threat to the viability and performance of small and medium-sized farms.

Hypothesis 6: Eggs are not as internationally marketable as frozen poultry meat. This means that egg production faces less competition from imports, and it is less dependent on infrastructure and cold chains. These aspects make smaller commercial operations in egg production viable.

The observation shared by all the interviewees, indeed all the actors in the sector, was that the national poultry sector was threatened by imports. However, the different branches of the sector, particularly broiler chicken and table egg production, are exposed differently to risks. Transportation challenge makes international trade in eggs difficult. Consequently, the egg production sector is less threatened by imports. This raises the question of whether table egg production units are more viable than other sectors of the poultry industry. It should also be noted that although the egg production sub-sector is not directly threatened by imports of frozen poultry cuts, it may face competition from imports of egg powder, which is easier to use for processing in the food and confectionery industry. As a result, egg powder Importation had an upward trend over the 2017-2020 period. According to customs statistics, egg product imports registered growth from 1,000 kg in 2017 to 11,000 kg in 2020 as the demand mayonnaise grew in the cities. According to the projections of the poultry interprofessional body, this upward trend will be increasing and is a real threat to the development of egg production sub-sector . Despite the low level of importation of eggs for consumption, the expansion of the egg production sector could be threatened by importation of egg powder and increase the risks faced by investors and therefore makes hypothesis 6 untrue in the Senegalese context.

Lessons Learnt

The Senegalese commercial poultry sector has been very dynamic over the past 15 years. There has been an increase in production and investment, but also creation of many jobs and growing interest of the private sector in the poultry industry. This study highlights the key success factors identified for Senegalese commercial poultry farming to better guide decision-making for the development of the poultry sector. The cross-case studies conducted allowed for the testing of specific hypotheses on key factors that have contributed to the development of commercial poultry enterprises. The analysis highlights five main key factors for the success of poultry farms in Senegal: business management and capacity strengthening, organizational support and

integrated contracts, access to finance and quality equipment, increased demand, and creation of outlets for production, but also import suspension applied since 2005.

a) What types of business models have been particularly successful in the recent past in the Senegalese context?

Ultimately, several business models have been particularly successful in the recent past in Senegal. (i) The first model refers to integrated poultry farming, with contract agreements with companies present throughout the poultry value chain. Indeed, risk management capacity is crucial for the development of a poultry business in Senegal. Contract agreements allows poultry farmers to spread the risk through several channels: the supply of inputs and poultry equipment, technical support throughout the production process, a secure outlet for production, and financial support to increase production capacity. (ii) A second investment model concerns the diversification of activities and the investment of savings. The interviews show that some poultry enterprises were established using private funds from other activities or the savings of partners. Thus, the poultry sector appears to be a means of investing savings after retirement or of diversifying an income portfolio. Moreover, we noted that 9 out of the 10 farms engaged in several activities that may be connected to the primary sector (vegetable gardening, tree farming), secondary (construction) or tertiary (telecommunication) sector. This may be a way for poultry farmers to finance their poultry investment or to invest funds earned from poultry farming. (iii) A common feature of most of the farms interviewed was their marketing model. Customer loyalty with three or four major customers, especially dealers, who keep being loyal buyers is a fairly successful model. In addition, the farms produced based on demand, especially during periods of high consumption (religious events, end of year celebrations etc.) (iv) different legal forms exist as SUARL, SARL, Sole Proprietorship, SA, so all the farms interviewed were formalized. Large family owned farms', future depends on the interest of the owners' heirs in the poultry business, non-family owned businesses have a more certain future.

b) What innovations have been critical to the growth of poultry businesses?

Technical innovations in production have been a determining factor in the development of poultry enterprises. The industrial equipment of the producers interviewed were at the same level of technology as producers in developed countries. The owners of the poultry enterprises planned to import modern buildings and state-of-the-art poultry technology to achieve automated production. This shows the «international portability» of much of poultry technology, it only needs limited adaptation to the local conditions. This is a key factor which explains the scalability of this production system. At the same time, qualified personnel are generally recruited from agricultural or poultry schools and universities to optimize their operations. Equipment and competent staff have notably enabled increased production capacities and productivity, and consequently improved the profit margins of these companies. The development of a delivery contract with modern slaughterhouses has also greatly contributed to the emergence of the enterprises because the outlets are secure and regular. Regularity has been favored by the development of the cold chain, particularly in urban areas where many consumers have access to refrigerators.

c) What policies were essential to attracting investors in poultry business development and under what conditions?

The main policy that has encouraged investment in the commercial poultry sector in Senegal is the suspension of imports of poultry products. The elimination of external competition, which is much more competitive than local production, has led to increased confidence in poultry farming among private investors. In addition, the government's fiscal policy, notably the VAT

exemption of agricultural equipment and inputs specific to the sector, has led to an increase in investment. The existence of the National Poultry Centre (CNA), research institutions, training schools and universities have also contributed to the development of the poultry sector.

The results show that capacity building and strengthening is a good way for poultry production units to manage risks, especially poultry diseases. Finally, financing is an important determinant of the success of commercial poultry enterprises. Self-financing is very common, but some enterprises benefit from financing programmes set up by the Senegalese government. The establishment of financing sources for the agricultural sector has thus enabled the sector to develop particularly the public support mechanisms for financing.

d) Under what conditions can the growth factors (policy interventions, innovations etc.) of the different types of poultry businesses be mobilized to help other poultry businesses grow?

The study shows that commercial poultry enterprises are dynamic and constantly seeking ways to improve their performance. The creation of a favourable managerial, institutional and economic environment has been the key to their success. However, several actions are needed to enable other poultry enterprises to benefit from these success factors.

1. Firstly, the development of the sector depends very much on the orientation of demand towards local products, to the detriment of imported products. This was mainly achieved by the suspension of importation. However, the possible lifting of the import suspension measure is causing a lot of concern among poultry farmers, who sometimes anticipate a drop in their investments. Thus, it remains essential that this measure be analyzed in all its aspects by decision-makers, researchers and stakeholders in the sector to simulate and anticipate the consequences of its lifting and to think about economic, tax and commercial policies (subsidies, tariffs, gradual lifting, quotas etc.) which could secure the sector to avoid its regression and collapse. Like the situation after the application of the WAEMU CET, small and medium-sized farms feel being the most threatened by the importation of cheaper products. Therefore, a political strategy on the part of decision-makers is essential for supporting the development of the sector. The application of complementary protection measures by WAEMU, ECOWAS and the WTO could also provide better support for the poultry sector if the measure is lifted (safeguard measures, the cap on the consolidated tax rate, compensatory measures, additional protection tax, etc.).
2. Another factor is the competitiveness of the sector, which could be decisive for its survival if the suspension is lifted. The price, quality and availability of inputs are common constraints for poultry production. The development of poultry feed with local raw materials could significantly reduce production costs. The use of groundnut cake in poultry production, for which Senegal has a comparative advantage, could be explored, and local maize production could also be supported to substitute imported maize. The government could also effectively regulate input prices to efficiently protect small and medium-sized enterprises who have little bargaining power. Therefore, for other companies to benefit from the key success factors identified, it is necessary to improve the profitability of their operations by lowering production costs and improving prices.
3. Access to finance and equipment must be facilitated and promoted for all levels of production. However, the lack of bank guarantees often limits access to finance for small and medium-sized enterprises. Thus, Government should intervene by setting up financing and investment facilitation programmes adapted to the existing production models. Commercial poultry development could benefit also from improved access to

finance by small producers and thereby securing their demand for chicks, feed etc. Thus, the microfinance sector could also contribute by easing access to finance by small producers. Also, production subsidies for the poorest producers would help to promote the development of the sector by guaranteeing opportunities for linkages with the commercial sector.

4. Increased demand is a significant determinant of the success of commercial poultry enterprises. However, it is clear from the interviews that market saturation often causes a decline in the performance of production units. Normally, companies projection of increase in demand informs increased production of broilers and table eggs. However, overproduction causes a sharp drop in prices, which can sometimes be below production costs. Producers may also suffer marketing difficulties due to market saturation leading to inability to sell causing massive destruction to limit losses. Thus, proactive actions could enable producers to reduce the risk of incurring losses. These include the establishment of an effective cold storage system that allows producers to keep their product for longer time, particularly in broiler production. In addition, the development of the processing industry is crucial for the egg production which suffers losses and remains unstable because of price fluctuations due to overproduction and underproduction. This would allow better profitability of the sector and therefore an increase in investments.
5. Regional trade in these products could also reduce price volatility of these commodities and be analysed and supported through the opportunities with the ECOWAS market as well as the arrangements under the Africa Continental Free Trade Area (AfCFTA).
6. Finally, other public policies are necessary for the development of the sector. Access to secure land that is specifically allotted for the poultry industry in land use planning and the development of municipalities is an essential factor for the development of the sector and the exploitation of its potential by the private sector. The public authorities must include poultry production areas in their development plans to protect the sector from urban pressures, non-monitored and wild expansion. In addition, access to water and electricity, particularly by encouraging investment in renewable energy, can promote the development of production units which has been facing the challenge of power outages and decline in the availability of water resources. Adequate coaching and policy towards the informal market could also be promoted through training, licensing, monitoring and better information system.

References

- ACS, 2014. Competitiveness and development strategy of the Senegalese poultry sector, provisional report MEPA/IPAS/SCA, 88p.
- APIX, 2015. Guide pour la création des entreprises au Sénégal. Agence pour la promotion des investissements et grands travaux (APIX)
- ANSD, 2014. RGPHAE 2013 Final report, Ministry of Economy, Finance and Planning, UNFPA/USAID, 417p.
- ANSD, 2021. Monthly bulletin of economic and financial statistics, Ministry of Economy, Planning and Cooperation, 110p.
- ANSD, 2022. Rapport des enquêtes de suivi de la pauvreté, https://www.ansd.sn/index.php?option=com_ansd&view=titrepublication&id=40
- Arbelot B., Foucher H., Dayon J.F., Missohou A., 1997. Typology of poultry farmers in the Cap Vert area of Senegal, *Revue Elev. Med. vet. Pays trop*, 50 (1), p: 75-83.
- World Bank, 2015. Urbanization Review. Emerging Cities for an Emerging Senegal, World Development Report 2015, Washington, 108 pp.
- World Bank. (n.d.). World Bank Open Data. Retrieved May 20, 2021, from <https://donnees.banquemondiale.org/>
- World Bank Group, 2021. Business reforms in Senegal - Doing Business, Retrieved June 25, 2021, from <https://www.doingbusiness.org/en/reforms/overview/economy/senegal>
- Chenal J. and Wade C. S., 2009. Dakar la ville double, in quelques rues d'Afrique. Observation et gestion de l'espace public à Abidjan, Dakar et Nouakchott, p: 66-80.
- CNA, 2016. Statistics 2015, modern poultry sector, MEPA/DIREL, 15p.
- CNA, 2017. Statistics 2016, modern poultry sector, MEPA/DIREL, 8p.
- CNA, 2018. Statistics 2017, modern poultry sector, MEPA/DIREL, 7p.
- NAC, 2019. Statistics 2018, modern poultry sector, MEPA/DIREL, 14p.
- CNA, 2020. Statistics 2019, modern poultry sector, MEPA/DIREL, 15p.
- CNCR/MEPA, 2018. National days of reflection and proposals for the development of traditional poultry farming, Executive Report, 43p.
- Delgado C. et al. 1999. Livestock by 2020. The next food revolution, IFPRI/ILRI/FAO, synthesis paper n. 28, 82p.
- Diop, A. 2005, Villes et aménagement du territoire au Sénégal. Doctoral thesis in geography, Dakar, Cheikh Anta Diop University.
- Duteurtre, G., Dièye, P. N., & Dia, D. (2005). Ouverture des frontières et développement agricole dans les pays de l'UEMOA : L'impact des importations de volailles et de produits laitiers sur la production locale au Sénégal. ISRA - Études et Documents, 8(01) http://www.bameinfopol.info/IMG/pdf/ED_vol.8_n.1-2.pdf
- Forecasting and Economic Studies Directorate. (2019). Business Climate Job Climate Quarter 4 2019 (No. 2019-02).
- Fall A. G., 2020. Restrictions des espaces pastoraux et croissance sectorielle de l'élevage au Sénégal. Thèse Univ. De Thiès, janv. 2020
- FAO, 2009. The State of Food and Agriculture. Livestock update, Rome, 186p.
- FAO 2014. Poultry sector Senegal, National Livestock Reviews of the FAO Animal Production and Health Division, No. 7, Rome, 70p.
- Faye, B. and Alary, V. 2001. Les enjeux des productions animales dans les pays du Sud, CIRAD-EMVT, INRA Prod. Anim, p:3-13.
- Hallen T. and Heirings P., 2016. New opportunities in the West African food economy, West African Notes, No. 1, OECD Publishing, Paris, 21p.
- Herrero M., Havlik P., McIntire J., Palazzo A., Valin H., 2014. The future of African livestock. Realizing the potential of livestock for food security, poverty reduction and environmental protection in Sub-Saharan Africa, UNSIC, Geneva, Switzerland, 118p.

Johnson M. C., 2011. Lobbying for trade barriers : a comparison of poultry producers' success in Cameroun, Senegal and Ghana, *J. Of Modern African Studies*, 49.4 pp. 575-599 Cambridge University Press

Ly C., 2020. Aviculture et Covid-19 au Sénégal: Situation et perspectives, Note d'information et d'analyse, IPAR, 43p.

MEPA/DIREL, 2018. National workshop on improving the performance of the Senegalese poultry sector, summary report, Saly Portudal/Mbour, 22p.

MEPA/AEC, 2019. Actualisation des paramètres techniques de la filière avicole sénégalaise, final report, 100p.

MEPA, 2020. Livestock Sector Review 2020, Draft version, 28p.

United Nations. (2016). Handbook on the least developed country category: inclusion, graduation and special support measures. In United Nations (Ed.), United Nations Publications (2nded.).

https://www.un.org/en/development/desa/policy/cdp/cdp_publications/2015cdphandbook_fr.pdf

Ndao M., 2012. Dynamiques et gestions environnementales de 1970 à 2010 des zones humides au Sénégal : étude de l'occupation du sol par télédétection des Niayes avec Djiddah Thiaroye Kao (à Dakar), Mboro à Thies et Saint Louis, thèse de géographie et aménagement à l'université de Toulouse 2 le Mirail et de l'université Gaston Berger de Saint Louis au Sénégal, 370p.

OECD/FAO, 2020. OECD and FAO Agricultural Outlook 2020-2029, OECD Publishing, Paris/FAO, Rome, 268p+appendices.

Pigeaud, F., 2003. Le poulet sénégalais se débat devant l'OMC. *Libération*, 128948.

Seck M., Abou M.M.N., Wade S., Thomas J.P., 2005. Adaptation to climate change: the case study of agricultural production systems in Sebikotane (Senegal), ENDA TM, 33p.

TACS ECONOMICS, 2017. New forms of urbanization in Africa, Africa Development Club Research Note, 29p.

Traoré E. et al., 2006. Economic stakes of avian influenza on the Senegalese poultry industry. *RIDAF Bulletin*, Vol. 16, 73p.

The World Bank Group, 2016a. Doing Business 2016: Measuring Regulatory Quality and Efficiency. In *Doing Business 2016: Measuring Regulatory Quality and Efficiency*. <https://doi.org/10.1596/978-1-4648-0667-4>

The World Bank Group, 2016b. Doing Business 2017: Equal Opportunity for All. In *Doing Business 2017: Equal Opportunity for All*. <https://doi.org/10.1596/978-1-4648-0948-4>

The World Bank Group, 2018. Doing Business 2018: Reforming to Create Jobs. *Doing Business 2018: Reforming to Create Jobs*. <https://doi.org/10.1596/978-1-4648-1146-3>

The World Bank Group, 2019. Doing Business 2019 Training for reform. 311. <http://www.doingbusiness.org/en/reports/global-reports/doing-business-2019>

The World Bank Group. 2020, Doing Business 2020. <https://doi.org/10.1596/978-1-4648-1440-2>

Steinfeld H., Gerber P., Wassenaar T., Castel V., Rosales Mendez M., De Haan C., 2006. *The Shadow of Livestock, Environmental Impacts and Options for Mitigation*, FAO/LEAD, Rome, 2009.

UEMOA, 2008. Poultry sector: meat and eggs, report, p: 50-61.

Appendices

Appendix 1: Interview guide for commercial poultry business owners

IPAR Pôle Elevage Action Research Project: Successful Commercial Poultry Farming in Senegal IPAR - PARI/ZEF/FARA

Interview Guide for Commercial Poultry Units

Date

Interviewer

PRESENTATION

CUSTOMARY THANKS

Purpose of the interview

- Institutions
- Terms and conditions
- Confidentiality and consent statement attached
- Explanatory notes on commercial poultry farming in Senegal
- Rationale for the study

START OF THE INTERVIEW

1. Company profile

- Do you own or lease the production site (land and equipment)?
- Is poultry production your primary or secondary activity?
- What are your other activities (in order of importance)?

2. Brief history of the company

- Tell us your story of setting up your business?
- In what year did you start this activity?
- What motivated you to invest in poultry production and marketing?
- What triggered this interest in you?
- What have been the major phases in the evolution of your company?

3. Main products manufactured

- What types of production do you currently do?
- For each type, how many subjects do you evaluate per production run?
- How many rotations do you make per year and per type of production?
- Do you use employees? If so, how many?

4. Source of funding

- How did you raise capital to start the business?
- Have you raised your own funds? By selling assets, by saving...?
- Have you taken out any loans with banks?
- How much do you estimate the initial amount mobilized?

5. Most important success factors

- Did any of the following contribute to your success? If so, how?
 - Legal structure and membership in the formal sector
 - Access to financing, loans
 - Company size
 - Relationships, partnership
 - Technical innovations and breeding techniques
 - Management and administration
 - Customers
 - Other (please specify) :

6. Growth indicators

- What is your average production per type of production and per cycle during the last 5 years? For each type, what was the selling price?

Number of batches/flocks of broilers per year

Batch size

Number of laying hens per year

Broilers

- Minimum production Minimum selling price
- Maximum output Max selling price
- Average production Average selling price

Eggs for consumption

- Minimum production Minimum selling price
- Maximum output Max selling price
- Average production Average selling price

- During these 5 years, what were the main problems encountered? Its impacts ?
- During these 5 years, what favourable conditions have made your production evolve?
- Have you recruited new specialists or workers during the last 5 years? If so, which ones? How many fo each type of employee?
 - Minimum
 - Maximum
 - Average
- What impact does your staff have on your bottom line?
- Does your staff receive ongoing training? If yes, who? and when? If not, why?
- Have you installed any new infrastructure in the last 5 years? If yes, what type(s) of investment? How many per type? per year? What were the reasons?
- How has your client network been built over the last 5 years?

7. What is the impact of the quality of technical support from input suppliers and service providers?

- Veterinarians
- Chick suppliers
- Feed suppliers
- Other (please specify)

8. What are the main factors (in order of importance) holding back your business? For each, how ?

9. What are the most common causes of mortality/morbidity?

- Diseases (which ones)
- Chick quality
- Feed quality
- Staff management
- Building quality

10. Professional organization

a. Are you a member of a poultry organization? If so, since when? Which one? What are its objectives ?

b. Is your organisation affiliated to IPAS?

11. How would you rate the performance of your operation with respect to:

Forces	1. Low	2. Average	3. Strong
Negotiating power with clients			
Negotiating power with suppliers			
The threat of competing local products			

The threat of imported competing products			
The threat of new market entrants			

12. How do you manage the above factors?

Forces	Management
Negotiating power with clients	
Negotiating power with suppliers	
The threat of the premises	
The threat of imported products	
The threat of new market entrants	

13. What do you think are the best investment opportunities in poultry farming? Please explain

14. What do you think about the future of your business?

- a. What future for the commercial sector? Why ?
- b. How to strengthen the Senegalese poultry industry and modern poultry systems?
- c. What measures are needed to reduce production costs?
- d. What are the alternatives for industrial poultry feed?

15. You have invested in poultry farming, if you had to do it again would you do it? If yes, why ? If not, why not ?

Other information

END OF INTERVIEW

Words of THANKS

Appendix 2: Interviewee consent form

Research Project Title: Commercial Poultry Successes in Sub-Saharan Africa
Funded by the Initiative Prospective Agricole et Rurale - IPAR, Dakar, Senegal (www.ipar.sn)
Forum for Agricultural Research in Africa (FARA) based in Accra, Ghana

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Project carried out in partnership with the Forum for Agricultural Research in Africa (FARA) based in Accra, Ghana and the European Development Research Centre (ZEF) based in Bonn, Germany

Research Project Objective: Using three countries (Nigeria, Senegal and Kenya) as study areas, the project aims to identify the success factors of commercial poultry enterprises in sub-Saharan Africa (particularly enterprises that produce and sell chicken and eggs) in order to support policy makers who aim to develop their country's poultry sector or donors who aim to support sub-Saharan countries to develop their commercial poultry sector. To this end, this research will analyze the drivers of poultry business growth using country case studies.

What your participation entails:

This is an invitation to participate in a research project conducted under the above-mentioned project and led by the IPAR research team. Your organization was chosen because of its important place in the Senegalese poultry value chain. As such, your participation in the interview and the information you will provide will help you make your voice heard about the challenges you face in commercial poultry farming. The data collected will be used to conduct an analysis of the success factors of commercial poultry operations in order to make recommendations for improvement. You will be asked to complete an interview guide with questions on a brief history of the business and your background, the factors that have led to the success of your business, the role of innovation in your success, the opportunities for growth of your business, the constraints that are slowing down the expansion of your business, and finally your perception of the future of the business. The data collected will only be reviewed by the research team before the results are made public. We know your time is valuable, but we are only asking for a little over an hour of your time and input to contribute to this research

Please note that your participation is entirely voluntary. You can choose to participate or not. If you choose not to participate, there will be no negative consequences. If you choose to participate, you can also refuse to answer questions that make you uncomfortable. If, for any reason, you decide to withdraw, your data will be destroyed unless you indicate at the time of withdrawal that the data may be retained by the researcher

We will leave you a copy of this form in case you need more information and can reach us directly by email at cheikh.ly@ipar.sn or coba@ipar.sn IPAR Executive Director and laure.tall@ipar.sn, IPAR Research Director or by one of the contacts within the research team.

Please sign below if you agree to participate in the study. Agreeing to participate in this study does not waive any of your rights or relieve the researchers of their responsibilities regarding the confidentiality of sources. To ensure that the study is conducted properly, authorized individuals, such as a member of the Research Coordinating Committee, may have access to your information.

A copy of this consent form will be provided to you and retained by the researcher.

Name of Participant: _____

Signature of Participant: _____ Date: _____

Thank you very much for your participation!

Researcher's name: _____

Researcher's signature: _____ Date: _____

Appendix 3. Comparative table for choosing a legal status for a company in Senegal

Legal status	Sole proprietorship	Limited liability company SARL/SUARL	Limited company Shareholder society SA	Economic Interest Group G.I.E
Minimum partners	1	1	1	2
Minimum start-up capital	0	100,000 FCFA/182 US\$ minimum to be paid in full upon incorporation	10,000,000 CFA / US\$ 18,180 minimum; ¼ paid on incorporation and the balance within 3 years.	0
Credibility with third parties	Very low	Important	Very important	Low
Responsibility of the partners	Unlimited (extended to the entrepreneur's personal property)	Limited to contributions	Limited to contributions	Unlimited and joint (unless otherwise agreed with third parties)
Eligibility for IC or EFE	YES	YES	YES	YES
Auditors	Without	Not necessary*.	Mandatory	Without
Direction	Contractor	Manager (partner or not) appointed by the partners	Chief Executive Officer, or Managing Director	President
Taxation of profits	One-off global contribution up to CFAF 50 million/US\$ 90,900 turnover for services and goods. IS on option	Corporate tax (IS) 30% of net profit	Corporate tax 30% of net profit	Single global contribution up to CFAF 50 million / US\$ 90,900 turnover for services and trade in goods (or IS on option)

Minimum flat tax	MFI: minimum due if the result is in deficit	0.5% of the turnover with a minimum of 500 000 FCFA / US\$909 and a maximum of 5 000 000 FCFA / US\$9 090.	0.5% of turnover with a minimum of 500 000 CFAF / US\$909 and a maximum of 5,000,000 CFAF / US\$9,090.	0
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