



Ministry of Foreign Affairs

# *Senegal Value Chain Study - Poultry*

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**SENSE**

## Senegal Value Chain Study - Poultry

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## Preface

### A promising future in agriculture

Senegal is expanding its food production with great ambition to serve consumers and spur rural development. Products of Senegalese farmers find their way to not only domestic customers but also to export markets in West Africa and the European Union. Dutch growers realized long ago that local circumstances are very favourable for the production of high-quality, nutritious agricultural products. The relative proximity to Europe and accessibility of the wider Sahel region make Senegal an attractive partner for close cooperation.

Partly due to climatic conditions, agriculture in Senegal certainly faces challenges, such as water scarcity and soil salinity. Dutch modern technology and expertise can support (further) improvement of overall performance and sustainability of production, post-harvest handling and marketing. It goes without saying that this will benefit Senegalese farmers to produce in a more sustainable, and profitable manner. Dutch innovative technologies could improve, for example, the use of quality seeds, precision agriculture, storage and packaging.

This 'scoping study' has analyzed those value chains in Senegalese agriculture to which Dutch expertise and technology can have the most added value for improved overall performance. In the framework of the study, a number of specific business cases have been developed, which could enable Senegalese and Dutch partners to cooperate (more) successfully. The overarching objective is to build a sustainable partnership between Senegal and the Netherlands around agriculture.

I thank the consultants of Sense for their good work. For more information on the study or advice, please contact our agricultural experts through [DAK-LNV@minbuza.nl](mailto:DAK-LNV@minbuza.nl).



**H.E. Mrs. Joan J.J. Wiegman**  
Ambassador of the Kingdom of the Netherlands to Senegal

## Préface

### Un avenir prometteur pour l'agriculture

Le Sénégal développe sa production alimentaire avec une grande ambition de servir les consommateurs et d'accroître le bien-être en milieu rural. Au Sénégal les produits agricoles sont vendus dans les loumas, les marchés locaux, et sont également destinés à l'exportation en Europe et dans les pays de la sous-région. Depuis quelques années, des producteurs néerlandais ont investi le Sénégal pour la fabrication des aliments nutritifs de très bonne qualité et pour son personnel qualifié et engagé. Du fait de sa proximité géographique avec l'Europe et l'accès facile aux pays du Sahel, le Sénégal demeure une excellente destination pour les affaires.

Cependant, l'agriculture sénégalaise est confrontée à plusieurs défis qui l'empêchent de prendre son envol notamment l'amélioration de l'agriculture durable en plein champ, le renforcement des produits post-récolte, du contrôle de la qualité et de la commercialisation; l'utilisation efficace des intrants et réduction des pertes alimentaires dans la production agricole (gestion de l'eau, fertilisation des sols, utilisation des semences de qualité). De par leur expérience, les entreprises néerlandaises pourraient être un grand atout pour l'agriculture sénégalaise. En effet au vu de cette situation, les investisseurs néerlandais sauront contribuer à amélioration de la performance globale de la production et du marketing en utilisant des technologies modernes qui rendent l'agriculture plus attrayante pour les jeunes professionnels tels que les semences de qualité, l'agriculture de précision, le stockage et l'emballage des produits agricoles.

Cette étude de cadrage agricole a fourni une analyse de certaines chaînes de valeur stratégiques de l'agriculture sénégalaise où la technologie néerlandaise peut contribuer à de meilleures performances et à des positions considérables sur les marchés de consommation. Il a également développé des analyses de rentabilisation tangibles pour que les partenaires néerlandais et sénégalais coopèrent et créent conjointement des entreprises prospères. Pour de plus amples renseignements ou des conseils, vous pouvez communiquer avec nos experts en agriculture à l'adresse [DAK-LNV@minbuza.nl](mailto:DAK-LNV@minbuza.nl)

**L'Ambassadeur des Pays Bas à Dakar**  
Son Excellence Mme Joan Wiegman

## Executive Summary

Many Senegalese rely on marine fish for the bulk of the animal protein in their diets. Increasing pressure on marine fish stocks is thus a particularly important issue. Protecting and replenishing these fish stocks is needed. However, alternatives also need to be developed. Eggs and chicken meat are gram for gram the next most affordable animal protein after sardines, which many would consider the national food of Senegal. Over the last decade poultry production has made a leap forward- both in terms of volumes produced and in the means of production. Today, most chicken is produced in a highly efficient large agro-industrial model. Small-scale producers have shifted to broiler production using imported genetics. The port of Dakar provides imported feed ingredients at competitive prices to producers, the majority of whom are clustered nearby along the coast and in Thiès. Sedima, the largest producer of chicken and eggs, now also produces hatching eggs locally. This increases the possibilities for local small-scale producer who already have ready access to imported supplies. This has created a relatively professional and efficient production model with feed conversion rates in line with global norms.

Some would argue that the development of production has far outpaced the ability of the market to absorb these chickens and eggs. Large industrial chicken producers in other countries have the luxury of being able to direct excess production volumes to the processing and food services (Hotel Restaurant and Catering) chain. In Senegal this is not the case. The market is oriented towards live chicken sale in open markets with few-if any- refrigeration points. The food services sector is small and processed chicken products are virtually unheard of. As a result, competition for market access is intense and intensifying. Large producers find themselves hemmed in by a lack of market development and outlets for their frozen chicken, but, having made significant fixed asset investments to ramp up their scale and produce competitively. For smaller commercial farmers oversupply means longer gaps between the end of the production cycle and the sale of the birds. This “over-run” has dire consequences for profitability because every day a fully-grown chicken is kept alive is money lost on feed. Furthermore, it reduces the number of production cycles per year. Any time there is a dip in demand the producers hold on to the birds that bit longer, affecting their ability to clear the cages and start a new rotation. If birds could be processed and frozen there would more flexibility in the system.

This strain in the market creates a cap on the scale of small-scale producers. At a scale below 2000 birds they can market their birds and eggs reasonably well. Any larger and this is not the case. Scaling up also requires greater investment in cooling to ensure that production can happen year around. The consequences are clear. There are few producers who produce at this middle scale. There seems to be some sense in identifying what can be done to help small scale commercial producers make a leap rather than a stepwise transition from small to medium and then large industrial scale.

It seems that stimulating the growth of small-scale producers without solving the marketing issues would only intensify pressures on existing producers. The key issue is therefore how to develop the market built around live chickens with no processing of chicken and eggs and a small food services sector?

There's a big overlap between broiler and egg producers in Senegal. As with broilers, egg production is similarly hampered by a lack of processing market. In modern egg production systems this sector absorbs the vast majority of eggs. This creates regular boom and bust cycles



for producers who are enticed in to egg production by rising prices and low barriers to entry in the egg market. Then as the market nears saturation, prices fall leaving many producers unable to sell their excess eggs. Producers exit, creating conditions for lower availability of eggs and rising prices. This begins the cycle anew. Finding an answer to the processing gap is thus critical to ensuring that the boom bust cycles regularly seen in egg production is broken.



## Résumé

De nombreux Sénégalais dépendent des poissons marins pour l'essentiel des protéines animales dans leur alimentation. La pression croissante sur les stocks de poissons marins est donc un problème particulièrement important. Il est nécessaire de protéger et de reconstituer ces stocks de poissons. Cependant, il faut aussi développer des alternatives. Les œufs et la viande de poulet sont, gramme pour gramme, la protéine animale la plus abordable après la sardine, que beaucoup considéreraient comme l'aliment national du Sénégal. Au cours de la dernière décennie, la production de volaille a fait un bond en avant, tant en termes de volumes produits que de moyens de production. Aujourd'hui, la plupart des poulets sont produits en suivant un grand modèle agro-industriel très efficace. Les petits producteurs se sont tournés vers l'élevage de poulets de chair en utilisant de la génétique importée. Le port de Dakar fournit des ingrédients d'aliments pour animaux importés à des prix compétitifs aux producteurs, dont la plupart sont regroupés à proximité de la côte et à Thiès. Sedima, le plus grand producteur de poulets et d'œufs, produit maintenant aussi des œufs à couvrir localement. Cela augmente les possibilités pour les petits producteurs locaux qui ont déjà un accès facile aux fournitures importées. Cela a créé un modèle de production relativement professionnel et efficace avec des taux de conversion des aliments pour animaux conformes aux normes mondiales.

Certains diront que le développement de la production a largement dépassé la capacité du marché à absorber ces poulets et ces œufs. Les grands producteurs de poulets industriels d'autres pays ont le luxe de pouvoir diriger les volumes de production excédentaires vers la chaîne de transformation et de services alimentaires (hôtellerie-restauration). Ce n'est pas le cas au Sénégal. Le marché est orienté vers la vente de poulets vivants sur des marchés ouverts avec peu ou pas de points de réfrigération. Le secteur de la restauration est petit et les produits transformés à base de poulet sont pratiquement inconnus. En conséquence, la concurrence pour l'accès au marché est intense et s'intensifie. Les grands producteurs se retrouvent coincés par un manque de développement du marché et de débouchés pour leur poulet congelé, tout en ayant fait d'importants investissements en immobilisations pour augmenter leur échelle et produire de manière compétitive. Pour les petits exploitants commerciaux, l'offre excédentaire signifie des délais plus longs entre la fin du cycle de production et la vente des volailles. Cet excédent a des conséquences désastreuses sur la rentabilité car chaque jour où un poulet adulte est maintenu en vie est de l'argent dépensé pour son alimentation. En outre, cela réduit le nombre de cycles de production par an. Chaque fois qu'il y a une baisse de la demande, les producteurs gardent les volailles un peu plus longtemps, ce qui affecte leur capacité à vider les cages et à commencer une nouvelle rotation. Si les volailles pouvaient être transformées et congelées, le système serait plus souple.

Cette tension sur le marché crée un plafond à l'échelle des petits producteurs. À une échelle inférieure à 2 000 volailles, ils peuvent commercialiser leurs volailles et leurs œufs raisonnablement bien. S'ils produisent à une plus grande échelle, cela n'est plus possible. La mise à l'échelle nécessite également des investissements plus importants dans le domaine du refroidissement afin de garantir que la production puisse se faire tout au long de l'année. Les conséquences sont claires. Il y a peu de producteurs qui produisent à cette échelle moyenne. Il semble judicieux d'identifier ce qui peut être fait pour aider les petits producteurs commerciaux à faire un bond plutôt qu'une transition progressive de la petite à la moyenne puis à la grande échelle industrielle.

Il semble que stimuler la croissance des petits producteurs sans résoudre les problèmes de commercialisation ne ferait qu'intensifier les pressions sur les producteurs existants. La question clé est donc de savoir comment développer le marché construit autour des poulets vivants sans transformation des poulets et des œufs et en disposant d'un petit secteur de la restauration.

Il y a un grand chevauchement entre les producteurs de poulets de chair et d'œufs au Sénégal. Comme pour les poulets de chair, la production d'œufs est également entravée par l'absence de marché de la transformation. Dans les systèmes modernes de production d'œufs, ce secteur absorbe la grande majorité des œufs. Cela crée des cycles réguliers d'expansion et de ralentissement pour les producteurs qui sont incités à produire des œufs par la hausse des prix et les faibles barrières à l'entrée sur le marché des œufs. Puis, alors que le marché approche de la saturation, les prix chutent, empêchant de nombreux producteurs de vendre leurs œufs excédentaires. Les producteurs se retirent, créant ainsi les conditions d'une baisse de la disponibilité des œufs et d'une hausse des prix. Le cycle recommence ainsi. Il est donc essentiel de trouver une réponse au problème de la pénurie de transformateurs afin de rompre les cycles d'expansion et de ralentissement que l'on observe régulièrement dans la production d'œufs.



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## 1 Background and Method

The aim of this study is to provide insights into the Senegalese poultry value chain and to define critical interventions that are needed for the sector to flourish. Ultimately it is hoped that these interventions will play a useful part in fueling an improvement in the livelihoods and food security of the Senegalese people, while improving the lot of women and youth and the environment.

More specifically the study aims to (i) describe the market, production and enabling environment in the onion chain in Senegal (ii) reveal the key issues, opportunities and bottlenecks in the value chain (iii) propose specific interventions that can help to address these bottlenecks & allow for the value chain to have greater impact (iv) identify areas where inclusive participation of women and youth in the economy can be stimulated (v) highlight opportunities for improved circular economy practices (vi) recommend areas where public, private and the knowledge sectors can make valuable, if not unique, contribution to these interventions.

The study involved 3 distinct phases. Firstly, desk research was conducted to understand the existing knowledge and open questions when it comes to the poultry value chain. This was supported by interviews with subject matters experts. Generally, these were people, businesses or institutions who provide supporting services, knowledge development or institutional support in the agricultural sector in Senegal. To get a better understanding of Dutch expertise and strategic and commercial interests, interviews were conducted with businesses who trade with Senegal, professional sector organisations, research institutes or service providers who offer knowledge services in aid of Senegalese agricultural development etc. To include insights on poultry market development in African countries, we consulted a South African poultry expert who has experience in providing technical support to various commercial poultry firms in the region. Experience from the UAE enabled us to gather insights in to production in high heat environments.

In step 2 we carried out field research in area surrounding Dakar and in Thiés. Thereafter, in step 3, interviews were carried out with 75 consumers, 15 traders and representatives in 3 cities/town in Senegal viz Dakar, Thiés and Pikine. 5 representatives from the Hotel restaurant and catering field (HoReCa) were interviewed in Dakar.

We must highlight that this research was carried out during the COVID 19 period, but after local constraints on travel were lifted. This has both advantages and disadvantages. A large number of interviews could be conducted telephonically, which made including a variety of perspectives and experiences from Senegal and the Netherlands far more possible. In some instances, the new “work from home” norm made interviewees more available. Nevertheless, access to farms, industrial producers, financial institutions, input suppliers etc. was possible during the fieldwork. These greatly enriched the quality of insight reflected in this report.

## 2 The Market

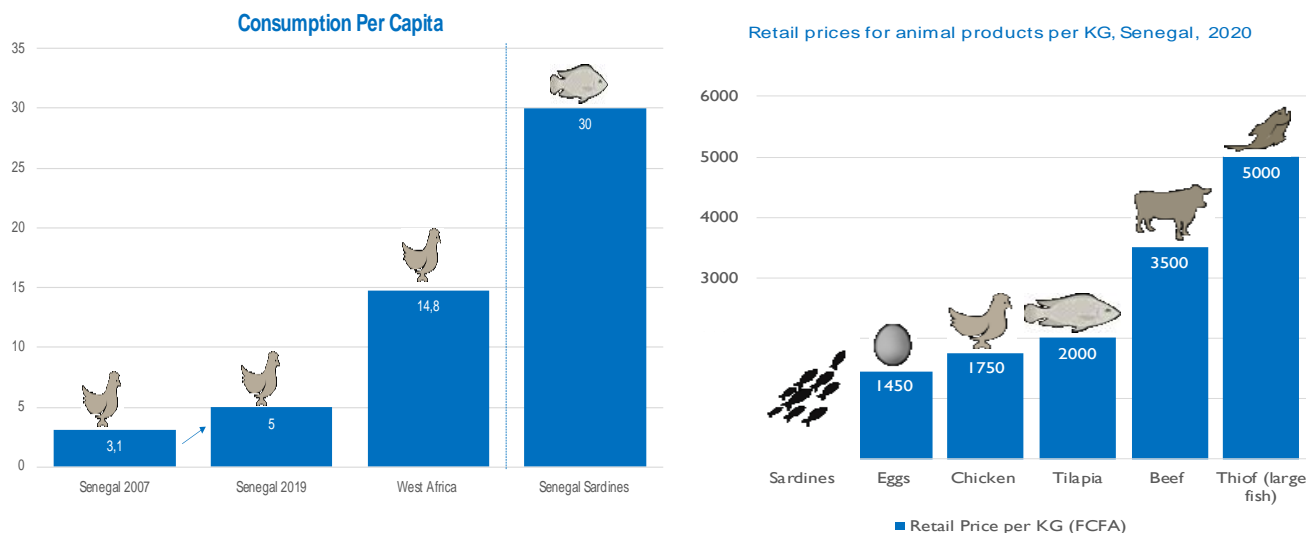
### 2.1 Chicken Meat

Per capita consumption of chicken has grown from 3.1 kg per capita in 2007 to almost 5 kg in 2019 but is still lower than the West Africa average of 14.8 kg per capita. About 70% of animal protein consumed in Senegal is marine fish, with an annual consumption of almost 30 kg per capita. Typically, chicken is consumed weekly or biweekly as it introduces some variety into the diet



(consumer research 2020). It's also consumed at events and festivities and is prepared for guests and the more special occasions in the year.

Figure 1: Consumption Per Capita of Poultry and Retail Prices of Various Animal Protein Products



Affordability plays a large role in consumption patterns of chicken. Yaboy (sardines), are widely available in local markets and can be bought for 30% of the cost of chicken.

The retail price for a chicken is around FCFA 2500 per bird (FCFA 2575 when plucked). The retail price per kg is around FCFA 1750, 3 times greater than sardines (FCFA 500/kg)-which is a sizeable increase in cost. As a result, it's eaten relatively infrequently. The entire bird is required to feed a family for 1 meal, so birds weighing at least 2.5kg live (2kg plucked) are clearly preferred.

A ban on chicken imports instituted in 2005 means that the poultry consumed is locally produced. Low trade statistics for Senegal and neighbouring countries suggest the ban is effective. Over 90% of Senegalese purchase poultry from open air markets. As in other African countries with import bans, most chicken, is bought live and then slaughtered and plucked at the market. Estimates suggest that at present this represents 70% of the market. In Dakar chilled chicken i.e. slaughtered is increasingly available. Upper income consumers who represent about 10% of the population can buy pre-packaged frozen or chilled chicken meat at modern retail stores. The supermarket and food services sector purchases from the large companies that use more professional abattoirs, e.g. Sedima.

## 2.2 The Market for Eggs

Egg consumption has grown in Senegal. Between 2017 and 2010, yearly consumption of eggs increased from 35 to 50 eggs per capita, largely because of growth in production. Typically, eggs are eaten in the morning for breakfast. Traditionally, Senegalese would use eggs to prepare mayonnaise at home. However, increasingly this is being replaced with imported packaged mayonnaise.

Despite the strong growth, egg consumption in Senegal is still low (around 50 eggs per annum per capita, compared to 230 in the EU and US). In part the low consumption of eggs could be caused

by the smaller size of the food processing industry. In the EU and US a large part of eggs are used as ingredients in the food industry. Eggs retail for 100 FCFA per egg. As with chicken meat, eggs are more expensive than sardines and so they are considered relatively expensive.

The chicken ban extends to the import of eggs. As a result, the eggs available in Senegal are local eggs, but from imported chicken breeds.

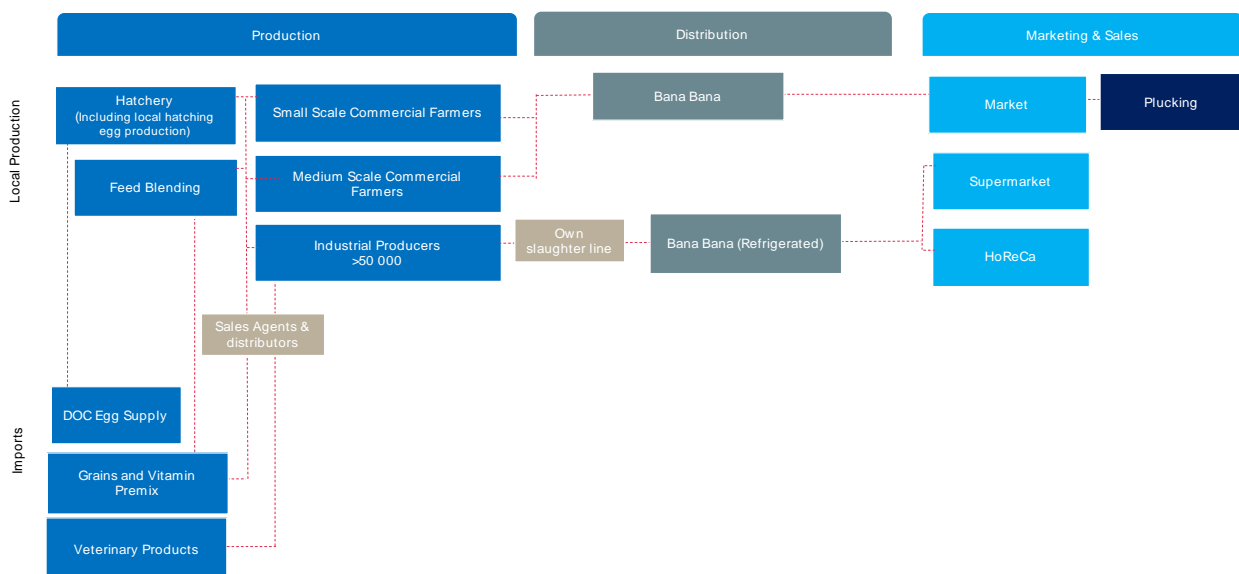
The start of the rainy season and Tabaski are two critical periods in the production calendar for small scale producers:

- In the rainy season small scalers typically sell off their flocks as it is a period with higher disease pressure. This sell off creates over-supply of live chickens in the market and prices fall.
- During Tabaski many families slaughter goats. In the period thereafter, they consume this meat and demand for chickens then falls. Many small-scale farmers aim to time production so that they miss this period.

Peak demand periods are in the run up to Ramadan or to the end of year celebrations.

### 3 The Structure of the Value Chain

Figure 2: Structure of the Value Chain



### 3.1 Poultry Production

#### 3.1.1 Growth of the sector

The growth of domestic production since 2005 has been spectacular. According to some sources, annual growth between 2005 and 2013 was 14.7% and 25% between 2016 and 2019. Recent estimates suggest that 53 million chickens, largely broilers, were produced in 2019. Most are produced by commercial broiler farms. Layers, who have reached the end of their production cycle, are also sold as chicken meat (6800 tons, USAID).

Chickens grow slower and mortality rates are higher at high temperatures. As a result, poultry commercial broiler farms are mainly located along the cooler Senegalese coast in the Niayes zone.

In the informal sector backyard producers use local and broiler breeds of chicken that are fed with local agricultural by products such as maize bran, or sometimes with some improved feed. Local chickens take about 6 months to grow and are sold for substantially higher prices because they are appreciated for their flavour.

Growing production volumes have come about largely because of increases sophistication in the commercial sector. Here, small scale commercial producers compete alongside large commercial producers and even an industrial producer.

Figure 3 Chicken Production Volumes in Senegal

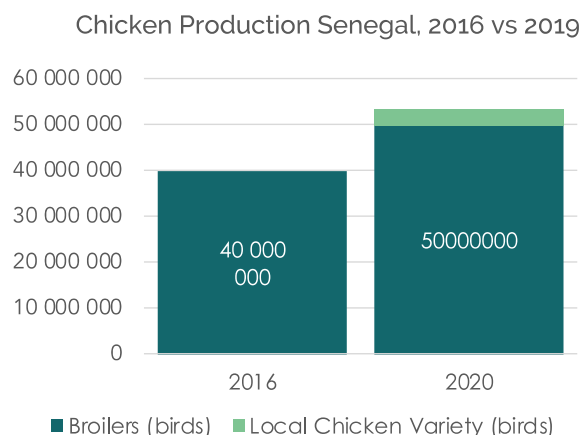


Figure 4 Broiler Production Locations in Senegal

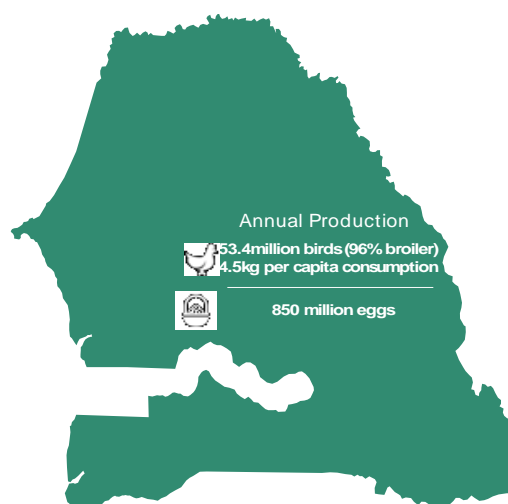



Figure 5 Commercial Production Systems

	DOC producers Official	4500 Small Commercial Units	4-5 Large Commercial Units	1 Industrial Vertically integrated Producer
	20 official >50 unofficial	1000-2000 birds 1425kg-2850 kg	>10000 birds 14520-17100kg	120 000 birds
		<ul style="list-style-type: none"> <li>– Imported broilers</li> <li>– Open air sheds</li> </ul>	<ul style="list-style-type: none"> <li>– Imported broilers</li> <li>– Cooled shed</li> <li>– Own Slaughter Lines</li> </ul>	<ul style="list-style-type: none"> <li>– Imported broilers</li> <li>– Cooled shed</li> <li>– Own Slaughter lines</li> <li>– Lead farmer with Outgrower model</li> </ul>



### 3.1.2 Informal, backyard producers

Most rural households raise chickens- both for meat and eggs. While some grow imported broiler breeds, they are also more likely to produce local chicken. The chickens are typical free range i.e. they are allowed to roam freely in backyards. Generally, broilers are vaccinated, and some degree of water and supplementary feeding is provided.

These chickens and eggs are then used by the family, are served to special guests at special occasions, or are traded or sold to neighbours.

### 3.1.3 Small Scale Commercial Broiler enterprises

The **smaller commercial units** produce on average 1000 birds per 45-day cycle. Some produce up to 2000, but this is less common. These birds are stored in open air sheds. At the small end of the production scale these sheds are fairly rudimentary.

Though in Senegal this is the least developed commercial producer group, their production system is often more sophisticated than that seen in the rest of Africa. They produce almost exclusively broilers, using imported day-old chicks; invest in vaccination and quality feed using imported ingredients. As a result, they're capable of producing chickens with feed conversion rates very much in line with norms in more developed poultry markets (1.6 kg of feed: 1kg of chicken).

Small scale farmers are particularly affected by the rainy season and the Tabaski period. They don't have the climate-controlled sheds that are needed to manage disease pressure during the rainy season. The heat also affects layer hens, who slow down or stop laying altogether. To avoid losses and low return on investment small scale farmers typically stop production and sell off the birds and eggs that they do have.

The steep decline in demand during Tabaski period also creates pressure on these farmers. They need to avoid ending their production cycle in this period, or they could be stuck with chickens.

### 3.1.4 Large & Integrated Industrial Producers

Large commercial producers in Senegal are more likely to produce chickens in the "tens of thousands" rather than the thousands. As a result of this scale they have been able to adapt farming practices in line with what you would see in far more developed markets. Firstly, they use air-conditioned sheds that allow for production all year round. Secondly, they have their own slaughtering lines with a fair degree of automation. Finally, they have freezer facilities to allow for storage and the smoother marketing of chicken. These producers have good access to independent traders who market their products around the country, but especially in Dakar which has a more developed chilled chicken market.

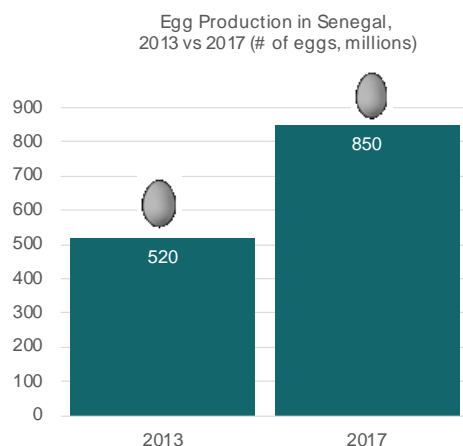
At the very top of the Senegalese producers is a **large integrated producer**, Sedima. They are involved in all activities in the poultry production chain including hatcheries, breeding farms, a feed mill and a food processing factory. Sedima is also the market leader in egg production. They produce chicken and eggs on their own farm, have independent contract growers and also supply inputs such as day-old chicks to independent growers and egg producers. The Sedima Dakar farm is fully automated and produces about 120 000 birds per 45-day cycle. In addition, they produce broiler chickens in a controlled outgrower system. About 20 producers both small (1000-2000 chickens per cycle) and large (>50 000 chicken per cycle) are in their system. Sedima provides all

the inputs as part of the contract and purchases the birds. The food services sectors (restaurants, hotels, caterers) as well as for formal retail (Auchan) are almost entirely served by Sedima.

### 3.2 Egg Production

About 520 million eggs were produced in 2013 in Senegal, with an annual growth of 6% from 2005. In 2017, according to a different source, allegedly 850 million eggs were produced, which would mean 13% growth per annum between 2013 and 2017.

Figure 6: Egg Production in Senegal



About 60 percent of eggs are produced by commercial farms. These are farms that have an egg production facility with egg processing and use imported genetics and modern production techniques such as battery cages and occasionally automated systems. Typically, there's a big overlap between the producers of chicken and eggs—especially at the level of small-scale backyard producers and larger commercial units. The eggs are sold in urban markets in the Dakar and Thiès regions. According to government contacts, in 2016, three commercial farms, Sedima, Avi Boye, and Jai Lax Mi, compete for approximately 82 percent of the market. Larger farming

operations can raise more than 300,000 layers. Table eggs are sold to hotels, restaurants, and wholesalers/retailers in 24-count egg cartons.

The remaining 40 percent of eggs produced are from smaller farms or informal operations that allow layer chickens to roam free on the property. It is unclear how much of this small farm production is split between local and imported breeds.

Layer chickens are recycled after 18 months and sold to intermediaries for slaughter at around 1,000 FCFA per bird of about 1.5 kg.

### 3.3 Input Supply

#### 3.3.1 Day-old Chick Suppliers

Since the ban on importing chicken meat there's been a dramatic move away from producing local chicken varieties. Where local chicken varieties are being kept, these tend to be backyard operations for eggs & occasionally layer meat.

Most commercial farmers have recognised that imported broilers have a higher feed conversion ratio and so make for far more competitive chicken production. As a result, day old chicks are largely from imported genetics. The import of hatching eggs is somewhat regulated, with importers required to get prior authorization from the Veterinary Services (DSV). This allows that checks can be carried out to ensure that the eggs are disease free. While this is open to any hatchery, in reality 2 importers are chiefly responsible for imports. These are Afitex and Invervolife.


The growth in production has stimulated growth- some would say uncontrolled- in hatcheries. In 2004, only 10 hatcheries had been established in Senegal. Today, there are more likely between 50 and 70 hatcheries operating- although only 20 of these are official.

The predominant breed of imported broiler hatching-eggs are Cobb 500 are Hubbard. These are sourced from Brazil, South Africa and India. Layer hatching-eggs come largely from Brazil. A variety of layer hens can be purchased which include Hisex, Hy-Line; Lohmann's etc.

Finally, the growth in the chicken market has catalysed investment in hatching egg production itself. The large industrial producer Sedima is now 70% self-sufficient and produces eggs from breeder stocks sourced largely France, Brazil and less often from the Netherlands. They still rely on imported eggs to close gaps created by peak demand periods e.g. productions in the run up to Ramadan or the end of year celebrations.

This local production comes at a major cost advantage. Typically, Sedima is able to retail day old chicks in Senegal for 250 FCFA, which is the purchase price of imported eggs from Brazil. The change to local hatching egg production could result in a halving of day-old chick prices when compared to those reliant on imported hatching eggs and to a country like Ivory Coast.

Figure 7 Day old Chicks Prices in Senegal & the Ivory Coast

	Day Old Chick Prices	
	Senegal	Ivory Coast
From local hatching eggs	*250 FCFA	**500FCFA
From imported hatching eggs	*440-650 FCFA	
Layers		700 FCFA
*Price of vaccinated day-old chicks.		
**Sourced from Poultry Sector Study Cote D'Ivoire, RVO.		

Despite the rampant growth of the day-old chick business and the more recent expansion of local egg production, a few large companies still dominate supply. Four companies service 86% of the broiler market, while 5 companies service 76% of the layer market. Some of the larger hatcheries have a capacity of 600,000 day old chicks per month. As a result, the market is well supplied. The largest hatcheries in Senegal are Sedima, AviSenegal, Avivet, ProDas and Jai Laxmi.

### 3.3.2 Imported & Local Feed Ingredients

Feed is by far the biggest cost in modern poultry farming and within the feed it is the protein component that is most expensive. Getting a good control on feed quality and costs are thus essential ingredients of a modern, competitive chicken industry.

The feed system in Senegal is well developed. Eight feed millers are able to produce between 50 and 800 tons of feed per day each. Sedima, Olam, NMA Sanders and FKS Mills account for the bulk of the market, estimated at 300,000 tons/year. Starter mash, grower and finisher for both broilers and layer chickens are available from agricultural input dealers across the country. The good feed

conversion rates amongst large commercial operations suggest that the quality of the feed is good. The feed is also priced in line with producers in the Ivory Coast and Ghana.

Interestingly, it seems that Senegalese layers reach a higher weight than those in Ghana and Ivory coast at the end of the production cycle. After 42-49 days chickens in Ivory Coast are approximately 1.7 kg.<sup>1</sup> compared to 2.4kg in Senegal before plucking (final weight 2 kg). This suggests a difference in the quality of the available feed as well as growing conditions, but would need to be verified.

Figure 8: Comparison of feed cost in West Africa

	Costs Senegal	Ivory Coast	Ghana
Retail (Broiler)	12 400 – 15 000 FCFA	11 800-14 500 per 50kg bag* (varying prices for starter, grower and finisher)	13 300-14 200 FCFA ** per 50 kg bag
Retail (Layer)	12 200-13 000 FCFA		
Wholesale	12 000 FCFA		
*Sourced from the Poultry Sector Study Cote Ivoire.			
**Sourced from 2017 Ghana Poultry Annual Report , USDA GAIN.			

The major components of poultry feed available in Senegal is based on the traditional recipe of maize kernel and soybean meal. These ingredients are generally imported from major grain producing countries such as Argentina and Brazil. Vitamin concentrates and premixes are imported from the EU. Finally, limited amounts of local ingredients are used such as peanut meal and fish meal.

We have to recognize that Senegal is not competitive in farming maize and soybean due to the limited availability of water and land, and relatively low soil fertility. It is also questionable if these scarce resources should be used for animal feed production. The poultry industry will remain dependent on imported soybean (cake) and maize. However, the close proximity to the Dakar port, which is one of the largest in Africa, helps to control import costs. In that respect, the Senegal situation is comparable to a large developed poultry producer such as the Netherlands which is also highly dependent on imported soybean and maize.

### 3.3.3 Veterinary Services

The quality, availability of veterinary services and products is good. Producers are able to access services from skilled service providers. Chicks are generally purchased vaccinated. As a result, disease outbreaks have been few and far between and have been very well managed.




<sup>1</sup> Poultry Sector Study Cote d'Ivoire, RVO



### 3.4 Route to Market

Chickens and eggs are largely sold via the informal market to consumers. Large industrial producers tend to focus on the food services sector or work with traders (bana-banas) who distribute live chickens to the markets.

Figure 9: Pricing in the Value Chain

	 Broiler, 2.5 kg live	 Medium Eggs 24 carton	 Large Eggs 24 carton
Plucking fee	+75 FCFA		
Retail Price (Market)	2500 FCFA	2500 FCFA	2500 FCFA
Wholesale Price	1700 FCFA	1400-1500 FCFA	1600-2000 FCFA

#### 3.4.1 Traders (Bana Bana's)

As with many African value chains, traders play a critical role in getting produce from producers to the markets in Senegal. They purchase chickens and eggs at the farm level, and then sell these to retailers in mostly open markets.

Bana Banas in the poultry chain have a distinct preference for sourcing from larger producers. These supply the bulk of their orders, enabling them to source their chicken from a few collection points. Those bana banas then use smaller producers to supply the chicken that couldn't be sourced from the large producers. As these bana banas are the critical gateway to market, these relationships are well protected.

Generally, their trade is in live chickens, which still make up 90% of the market. At the start of the rainy season and Tabaski, the traders are aware that prices of chicken will fall. They use these moments to stock up on chicken, which are slaughtered in the farm before being taken to a "plucker" to have feathers removed. This chicken is then frozen and sold later in the season to "poissonerie" (fish stores) who also sell chilled or frozen chicken.

There are also some traders who are large enough to deal with the large commercial sellers. They generally supply to supermarkets e.g., Auchan and use refrigerated trucks to collect and distribute the chicken.

#### 3.4.2 Retailers & Pluckers

Bana Banas, who mostly trade in live chickens, sell chicken and eggs to wholesalers or retailers in the markets. Typically eggs and chicken are sold at the same stall. In the case of live chicken these are stored in small cages or pens until they can be sold. The bird is then slaughtered, and the customer has an option of paying a "deplumeuse" to pluck, eviscerate and clean the chicken. This is carried out manually or using small machinery that helps with plucking.

Figure 10: Simple Artisanal Plucking Machine



In the case of manual plucking the chicken is dipped in hot water before being defeathered. Generally, this service, whether manual or automated, is offered near to the retailer for a small fee of 75 FCFA per bird.

For those chickens being sold to fish stores, the chicken (plucked and frozen) is stored in cooled freezer chests. These chests are not connected to the electricity mains but are instead filled with ice to keep the chicken cool.

### 3.5 Indirect Actors in the Poultry Value Chain

The poultry & eggs value chain is well developed in Senegal. A variety of indirect actors play (potentially) in its operations.

#### 3.5.1 Veterinary Regulation

The quality of imported hatching eggs is managed by the Directorate of Veterinary Services (DVS). They issue the import permits for hatching eggs and are responsible for quality check on the eggs. They are also responsible to managing the veterinary services in Senegal, which includes control over vaccinations and disease outbreaks.

#### 3.5.2 Equipment Supply

Typically, equipment is sourced directly from suppliers in the EU. Imports from France seem to be more established. Sourcing of second hand equipment seems fairly commonplace.

#### 3.5.3 Professional Organisations

The Poultry professional association, IPAS, has made great inroads in to organizing the sector. It has participation from the largest poultry producer in Senegal, SEDIMA, who at present holds the position of general secretary. The association has 4 divisions- producer, Feed suppliers, hatcheries and service providers. Producers thereafter have 2 separate sub-divisions. 30 Large producers work together in one branch, with the balance of the producers working together in another.

They are active especially at lobbying and have been able to keep the regulatory authorities firmly supporting the import ban on uncooked chicken meat.

#### 3.5.4 Banks and Microfinance Organisations

In recent years, the State has developed new initiatives aimed at improving access to finance through the establishment of structures such as the National Bank for Economic Development (BNDE) and the Priority Investment Guarantee Fund (FONGIP).

These were designed to increase access to financial products in general through the formal banking system. In theory producers in the poultry and egg sector are able to access finance through the larger banks such as the CNCAS<sup>2</sup>. The costs of administration, smaller footprint of these banks and the type of products they provide however generally makes these more suitable to large industrial or integrated producers.

<sup>2</sup> Caisse Nationale de Crédit Agricole du Sénégal

When it comes to small scale commercial producers, self-financing is the norm. They rely on credit from friends, family and personal networks. Where financing is sought from the formal banking sector, this tends to be from MFI's such as PARMECAS<sup>3</sup>, ACEP<sup>4</sup> and the Banque Mutualist, which have better coverage, more suitable products, lower administration fees and a greater capacity to screen lenders and collect repayments. The credit is suitable both for working capital and for smaller loans for capital investment such as for constructing sheds or purchasing feeding equipment etc. Typical loan values for small scale producers are 500 000 FCFA, which is issued for a 1-year period on working capital and 16% interest. Typical local values for capital investment in sheds, feed equipment etc., is 1mio FCFA, over a 3-year period and with 18% interest rates per year. These loans can be accessed by individuals or groups of producers.

### 3.5.5 Agricultural Insurance in Senegal

Agricultural insurance been developed fairly recently in Senegal . The National Agricultural Insurance Company of Senegal (CNAAS) works closed with Banque Agricole and offers a variety of insurance products in all agricultural sectors with the exception of livestock and fishing. These products tend to cover the risk of crop failure due to flooding or (index insurance), to damage caused by birds, wildlife, etc.

The ambition of the fund is to extend coverage to all agricultural producers, especially when they access credit. This involves working with the formal banking system as well as MFI's, who have better coverage with small scale producers. Agricultural insurance is thus available to the poultry and egg producers, but they do not have access to government subsidies for their premiums.

Industrial producers generally take out insurance for the full value of their production. Small scale producers who do have insurance products tend to insure only the value of their inputs. Despite insurance being available in principle from CNAAS, MFI's working in the poultry sector didn't require agri-insurances for access to credit. Only life insurance was mandatory. In fact, they didn't offer agri-insurance products at all.

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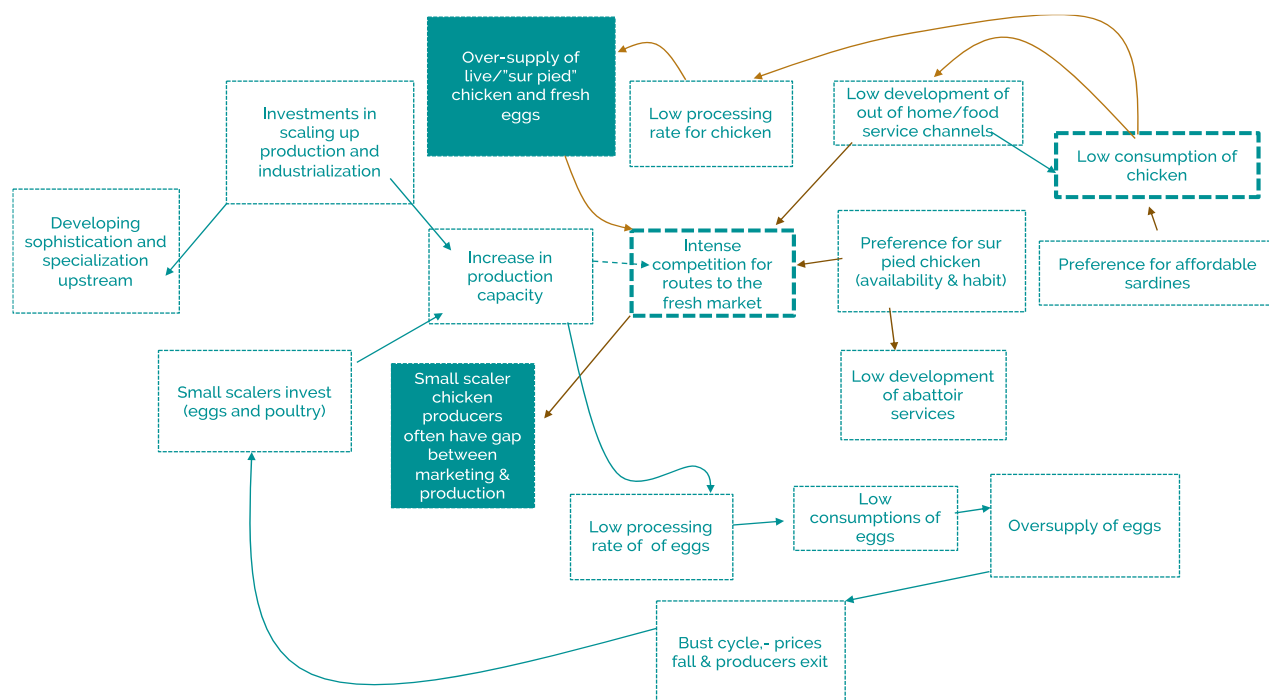
<sup>3</sup> Partnership for Mobilizing Savings and Credit in Senegal (PAMECAS)

<sup>4</sup> Alliance of Credit and Savings for Production (ACEP)



## 4 Issues and Opportunities along the Value Chain

Figure 11 Critical Issues in the Poultry and Egg Chain



### 4.1 Low Market Development for Production Capacity

Over the last decade significant private sector investment has been instrumental in scaling up production in Senegal. There are far more commercial producers in the sector than even 5 years ago. Also, those in the sector have introduced more technology, their own slaughter lines and freezers that have enabled them to produce at a far larger scale.

Yet it seems that the growth and development of the demand end of the equation has not kept pace with production. Chicken is still consumed at home, largely with the family and only once a week. There seem to be some signs of the chilled chicken segment developing in Dakar. But outside of this top-end segment and the limited food services segment, most Senegalese continue to purchase live chicken, “sur pied” from markets and neighbours.

This stilted development in the demand side has a knock-on effect upstream. Firstly, slaughtered and frozen chicken are critical to producers being able to keep a strict control over the production cycle and the consequent feed conversion rates. Keeping chickens in production for just a few days after they have reached the end of the production cycle has a marked effect on the feed conversion rate.

Secondly, freezing or even chilling chicken has a smoothing effect on the market. When chicken production exceeds demand, the chicken can be frozen. And these volumes can be used when demand peaks- for example around festivities. Another key mechanism to smooth out demand is processing. When chicken surpluses, the chicken meat can be converted into new formats that are relevant at different meal occasions. Eating a whole chicken on the go, isn't as convenient as a

cold cut on a sandwich. And these different formats open up opportunities for variety and so greater consumption at and in the food services sector.

But these critical outlets for chicken have not developed in Senegal. As a result, large industrial producers face surpluses and uncertainty around marketing of chicken at various moments in the year.

A second affect is that it intensifies competition for markets in the fresh market. Large commercial producers tend to lock in traders, who are in turn only too happy to deal with a few large, reliable suppliers. Small commercial producers feel the pinch. At the end of their 45-day cycle many don't have ready buyers for their full production volumes. Extending the production cycle reduces the feed conversion rate. And as the space and working capital is needed to begin a new round, the gap between production cycles can be unexpectedly long. Generally, these producers plan for a 2-week gap between production cycles. But this can be longer.

#### 4.2 Low Processing Rate for Eggs

Egg consumption in Senegal is likewise low when compared to the scale of commercial and informal production that is possible. In more developed markets egg consumption is increased by using eggs in processed products. Egg powder is found in formulations for baked goods and desserts, sauces, thickeners etc.

In more developed markets the processing segment provides a useful outlet for large volumes of eggs and helps to absorb surpluses. But this stabilising force is absent in Senegal. As a result, the market is prone to boom bust cycles. New entrants and scaling up creates surpluses in the fresh market. Many small scalars then "dump" their eggs aiming to minimise losses rather than being stuck with eggs that they can't sell. This creates a bust cycle with producers exiting commercial production. And then as volumes rebalance and prices stabilise, more investments get made in production of eggs, beginning the boom bust cycle anew. Stabilising the egg market hinges on developing a processing segment.

#### 4.3 The Market Access Gap

Small scale producers typically have a 45-day growing cycle. At the end of the cycle they take their sheds out of rotation for 2 weeks for a planned cleaning period. During this period the producer is also marketing the chickens. If the chickens are sold quickly, then they are to clean the sheds as planned and begin a new production cycle. However, if it's difficult to find buyers, then the production cycle for the chickens is extended. This is especially true if the scale of production is on the smaller end of the scale. Traders tend to favour larger producers, who can fill all, or most of their order volumes.

The impact of this market access gap is threefold. Firstly, feed conversion ratios in small scale commercial units vary from just above the global benchmarks of 1.6 to 2. Secondly, without working capital to pre-finance the next cycle they reduce the total number of cycles possible per year from 8 to 6. The cost of the market access gap, even when a few days are scheduled in for cleaning, is thus high. Farmers lose 25% of the potential revenue from this issue alone, before we've included the cost of feed.



At the end of the life cycle broilers consume about 100 g per day of feed. At the current costs of finisher each additional day costs 24.80 FCFA per bird. With flock sizes of 2000 birds this is a substantial reduction in potential income.

Figure 12 Costs Associated With Delay in Sales of Mature Chicken

	Market Access &/or working capital	Market Access Gap with no working capital
	45-day cycle	45-day cycle + 2-week marketing period
# of cycles per year	8	6
Cost of feed per bird each additional day		24.80 FCFA per day (based on 100g per day)

#### 4.4 Access To Finance for Small Scale Producers

The Formal Banking sector has an interest in extending credit to poultry producers. However, they have struggled to develop products that have a good fit with small scale producers. In general, administrative fees are seen as being too high for these products to be relevant.

Financing products are available to small scale producers largely via micro finance institutions, who have a good footprint in rural areas in Senegal. However, in general, Senegalese farmers are unaware of available financing products. They also have a tendency to rely on private financing from friends, neighbours and family rather than the formal lending. A recent study suggested that only 3% of Senegalese get credit from the formal sector.

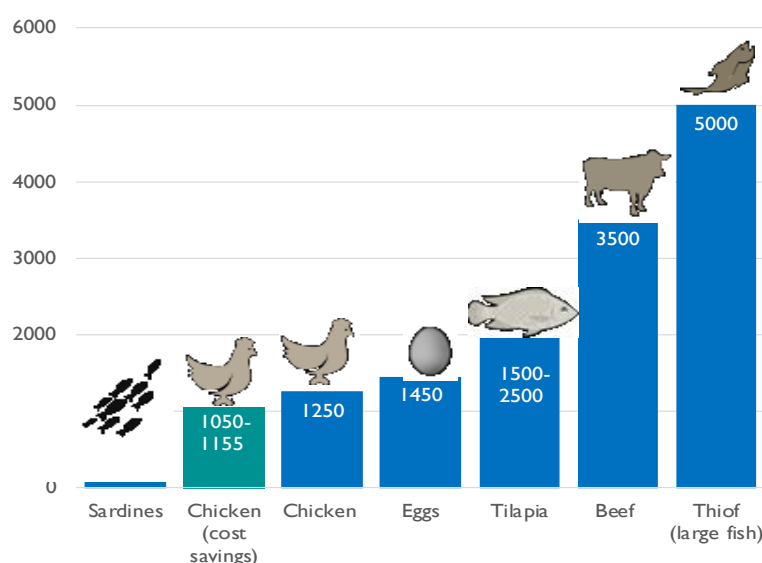
This is true of the poultry sector too. Most small scaler farmers self-finance production or turn to personal networks to secure working capital or capital to expand. This gap in awareness of financing and its associated costs versus benefits has resulted in a low uptake rate of available financing products. This limits the potential of farmers to expand production, either through increasing the number of production cycles per year, or the size of the flock per cycle, which is important to get traders interested.

The risks associated with the rainy season, both in terms of disease pressure and price volatility, means that some MFI's are more careful with the loans they offer for production during this specific time of the year.

#### 4.5 Affordability

The affordability of chicken has been highlighted as being an important barrier to more frequent purchase amongst Senegalese shoppers. Reducing sales prices and production costs are thus an important ingredient for growing demand for chicken. Local production of hatching eggs, which is currently done only by Sedima, provides at least a 190 FCFA-400 FCFA cost saving per chicken bought. It brings chicken to being just over twice as expensive as sardines per kg and ensures that it's very competitively priced when compared to Tilapia (per kg). What seems like a modest cost saving could have widespread benefits for the sector.

Figure 13 Price Per Kg of Selected Meat Protein in Senegal



As companies invest in hatching egg production, it will become more important to ensure that the genetics are good and that growth rates remain high. There are some concerns that the growth rates of chickens from local hatching eggs from Sedima are slower when compared to those from expensive imported hatching eggs. This would need to be verified, especially as the feed conversion rates amongst farmers in the Sedima system seem to be in line with global benchmarks. Nevertheless, to see continued benefit it's important that these local hatching egg producers remain up to date with the latest

techniques, invest in renewing genetics and continuous improvement at their facilities.

#### 4.6 Small Scalers Not Producing in the Wet Season

Production in the rainy season tends to taper off in Senegal. The wet, hot conditions tend to increase the disease pressure and are not ideal conditions for chicken growth or laying off eggs. Typically, this would be solved by investing in climate-controlled sheds. Yet in Senegal many producers have expressed scepticism in the affordability of climate-controlled sheds with less than 10 000 birds per cycle. Without suitable small-scale technology, farmers are left having to cope with a fewer production cycles.

#### 4.7 Disease Prevention

The sector has been fairly good at managing disease. This is in part due to the high use of vaccinations and good access to veterinary products and skilled personnel. Nevertheless, growing chicken production, especially in intensive models of product, requires that the sector remains focussed on disease prevention as well as in developing early warning systems for small scale farmers.

Firstly, this requires a firm focus on the production methods that are being used. Secondly, it requires support of the veterinary services, which include DVS so that these services and products remain available and used. Finally, small scale farmers around the world are typically last to hear about disease outbreaks and have the lowest skill levels to deal with outbreaks. Ensuring that they have early warning systems and sufficient training to be able to prevent and respond to outbreaks could be an important protection for the sector.

#### 4.8 Regional Competitiveness

Poultry production in Senegal is particularly more developed than in much of the region. The quality and price of inputs seems to be comparable if not better. Thanks to the Port of Dakar and

production relatively close to the city, feed costs should at least in theory be better than elsewhere in the region. Finally, the presence of industrial integrated producers and their organising effect on the sector is a real advantage. They have brought in the right technology and agricultural practices and have created scale in the market to be able to support quality veterinary services. As a result, Senegal has the potential to become a competitive regional producer.

#### 4.9 The Missing Commercial Middle Hypothesis

Commercial sector development in Senegal seems to be following trends in both developing market and to some extent in the EU. There seems to increasingly be 2 modes of commercial production- small scale production, or large industrial production. But why is this the case?

This can potentially be answered by examining the impact of scale on market access and costs. At 2000 birds per cycle, farmers are still able to access markets relatively well. If they have over-runs of a few days, the costs are manageable. However, scaling up has a few implications. At a larger scale, it becomes very important to have a system to reliably supply traders all year around and then to mop up over-supply. This requires a shift to cooled sheds and frozen chicken. Yet, local producers suggest that the scale required to make this feasible is over 10 000 chickens for broilers. Being able to gradually grow in scale seems very challenging- especially with the additional risks around market access, volatility and the risk of producing in open air sheds without climate control.

### 5 Environmental Sustainability (Circular Economy)

On a macro level developing a local industry holds significant environmental benefits. It allows for Senegal to produce food close to where it's produced. For the chicken and egg sector this is negatively affected by the reliance on imported grain for feed.

From the perspective of circular economy, the sector performs quite well. In the case of large industrial producers' waste at their processing facilities are sold as pig feed. Across the chain animal excrement is sold to the fertiliser chain. Thus, waste in the chain is quite low. Feed conversion rates are fairly efficient and the "just in time" production system ensures that waste is minimised in the sales and distribution system.

There are potentially some emerging, yet still relatively minor issues, around energy and animal welfare. The more developed segment of the sector- i.e. industrial producers have made a shift from the low energy system of the "just in time model" to the more energy frozen or chilled chicken. Managing energy consumption tightly is thus something to watch and manage. It will also become more important if the sector makes a shift to more chilled or frozen chicken sales.

Animal welfare is another small emerging theme amongst shoppers. Many were concerned about the environmental conditions in which the chickens are grown. This was less for the benefit to the welfare of the chickens but rather for the impact on the quality of the meat. This concern could be partly caused by disease outbreaks in the early 2000s. Diseases in the poultry sector have been relatively well managed. Nevertheless, it would be beneficial to take some preventative action in the poultry sector to ensure that safe farming techniques are used; veterinary services remain available and by ensuring that there are some early warning systems built in so that small scalars are aware of outbreaks and are able to react before it's too late.





## 6 Socio-Economic Development (Food Security, Employment, Women and Youth)

The poultry sector is estimated to be a 130 billion FCFA business (17% of livestock GDP). More than 500 000 people are employed in direct and indirect jobs. This alone would make it an important activity to safeguard. Yet the chain has an equally, if not more important role to play in food security.

Declining fish stocks and overfishing in Mauritania for fish meal production threaten the supply of sardines and larger fish varieties, which are a key part of the Senegalese diet. Chicken and eggs are the next most affordable animal protein source. By ensuring that this sector is robust, and chicken becomes more affordable you provide some degree of self-sufficiency and resilience in protein production.

The poultry sector also provides opportunities for better inclusion of women in commercial activities. Women are traditionally involved in informal chicken production. Commercial chicken production thus has a good fit with the traditional activities of women. Small scale commercial production also has low barriers to entry. The good organisation of input supply means that they are able to relatively easily access quality inputs. Poultry and egg production can be done relatively intensively, the staff requirements are low, and it demands comparably small areas of land for production. These small plots of land can easily be rented.

On the other hand, we need to recognise that access to finance is one of the major challenges facing women wanting to begin commercial chicken production. Household savings are typically used to finance the activities of men in the household. One advantage that women have in this sector is that they are favoured by MFI's involved in extending loans in the sector. They recognise that women are often more reliable repayers, especially when they are organised in to women's cooperatives. So, access to finance could be possible, but women need to be organised and made aware of the opportunities.

## 7 Options for Intervention

### 7.1 SWOT Analysis

The following SWOT analysis provides a summary of strengths, weaknesses, opportunities and threats:

#### Strengths:

- Continued industrialization and investment has created a dynamic and efficient sector
- High quality imported inputs delivering world class feed conversion rates
- Market protections prohibiting the import of chicken meat or live chickens
- Good veterinary controls, high use of veterinary products and vaccinations and skilled veterinary staff

#### Weaknesses:

- Low market development versus production capacity (low consumption rates of chicken and eggs, low development of out of home consumption, undeveloped processing)
- Preference for sur pied chicken over frozen, which creates a "just in time" market dynamic
- Small commercial producers have fluctuating food conversion rates



<ul style="list-style-type: none"> <li>– Competitive input supply especially day-old chicks</li> <li>– Low waste, which generally gets converted into fertilisers and pig feed</li> </ul>	<p>because of poor linkages to traders at the critical 45-day mark</p> <ul style="list-style-type: none"> <li>– Production stoppages for small scale producers in the rainy season with sharp declines in prices at the start of the season</li> <li>– Falling demand in the Tabaski period</li> <li>– Unclear how small scalers can make a gradual transition to larger scales of production (a missing middle).</li> </ul>
<p>Opportunities:</p> <ul style="list-style-type: none"> <li>– Projected Urbanisation that should increase demand for animal protein</li> <li>– Declining fish stocks will encourage shoppers to look for affordable alternatives</li> <li>– Good fit with the traditional activities of women and youth, with low barriers for their entry</li> </ul>	<p>Threats:</p> <ul style="list-style-type: none"> <li>– Borders remain closed to imports. Without these protections there is a risk that local producers may not be able to compete</li> </ul>

## 7.2 Interventions (SDG Goals and Impact, Dutch Transfers)

There are a few areas along the value chain that could benefit from intervention. Supporting small scale producers to improve their farming skills and ensuring that the veterinary systems remain strong would help to ensure that production is safe and disease free. There are also opportunities to increase participation of women in the commercial poultry production through training and access to finance.

Yet these interventions would not address the fundamental challenge of the sector: the lack of market development. Industrial producers have made investments to increase their scale of production and improve efficiencies. But this has outpaced the growth in demand, has come without the development of a processing sector and very slow development of frozen chicken segment which typically helps to absorb over-supply and ensures continuity of supply during demand peaks. This has created a severe logjam in the development of the chain. Industrial producers and small-scale commercial farms are all competing for the same market- live chicken- and market distribution systems (bana banas). Without the technology being used by industrial producers, the producers in the middle can't compete. Small scale producers are forced to hold chicken for longer than then 45 day cycle, which is not a competitive production model.

Tackling this fundamental question of market development is critical to being able to transform the sector to one that is more sustainable and is ready to compensate for declines in sardine production. But for this to happen, many questions will need to be answered. Is there a local market for frozen and processed chicken? If so, what infrastructural changes are required to make the shift from live chicken consumed at home, to a frozen chicken market with a stronger food services sector? Can the advantage of industrialised chicken production enable Senegal to become a regional production centre? Are there opportunities to process chicken eggs? And if so, which products should be produced for which markets?

Getting to grips with these questions will provide some roadmap for development of the sector. It's a core ingredient for large industrial producers to be able to tackle the current demand ceiling and to ensuring that the sector becomes more sustainable.

### 7.3 Overview of Proposed Interventions

Bottlenecks	#	Interventions	Fit with Dutch Knowledge, Strategic interests etc.	SDG Goals
Poor market development of chicken & eggs creating a ceiling on the growth of production.	1	Explore market development mechanisms especially the market opportunities for frozen chicken, processed chicken, processed eggs (especially egg powder).	***	8
Market access for small scale farmers who are pushed to hold live chickens beyond the 45-day cycle.	2a	Explore mechanisms to include small scale farmers in a new frozen or processed chicken opportunities.	**	1,2,5
	2b	Support activities that increase access to finance, especially for working & investment capital for women.	**	
Expand local hatching egg production to enhance affordability of chicken.	3	Increase capacity of local hatching egg production. This includes increasing the quantity and quality of chicks produced.	****	8
Ensure good farming practices, support of veterinary services and early warning systems to keep tight control of diseases.	4a	Reinforce the good practices around disease control by expanding training of small-scale commercial producers, strengthening of veterinary services knowledge and skills. Develop early warning systems for disease outbreaks in the poultry sector including pro-active interventions around health and safety.	****	1, 2, 4, 5
	4b	Support small scale farmers with continued education (farming techniques and financial literacy) to ensure continued competitive and safe production.	***	
	4c	Develop early warning systems for small scale producers around disease outbreaks.	**	
Opportunities for women and youth produce eggs	5	Support women by investing in skills development and access to finance.	***	4, 5

and chicken (provided that local market development is occurring).

### Sustainable Development Goals



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With many thanks to the following participants who gave so generously of their time.

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