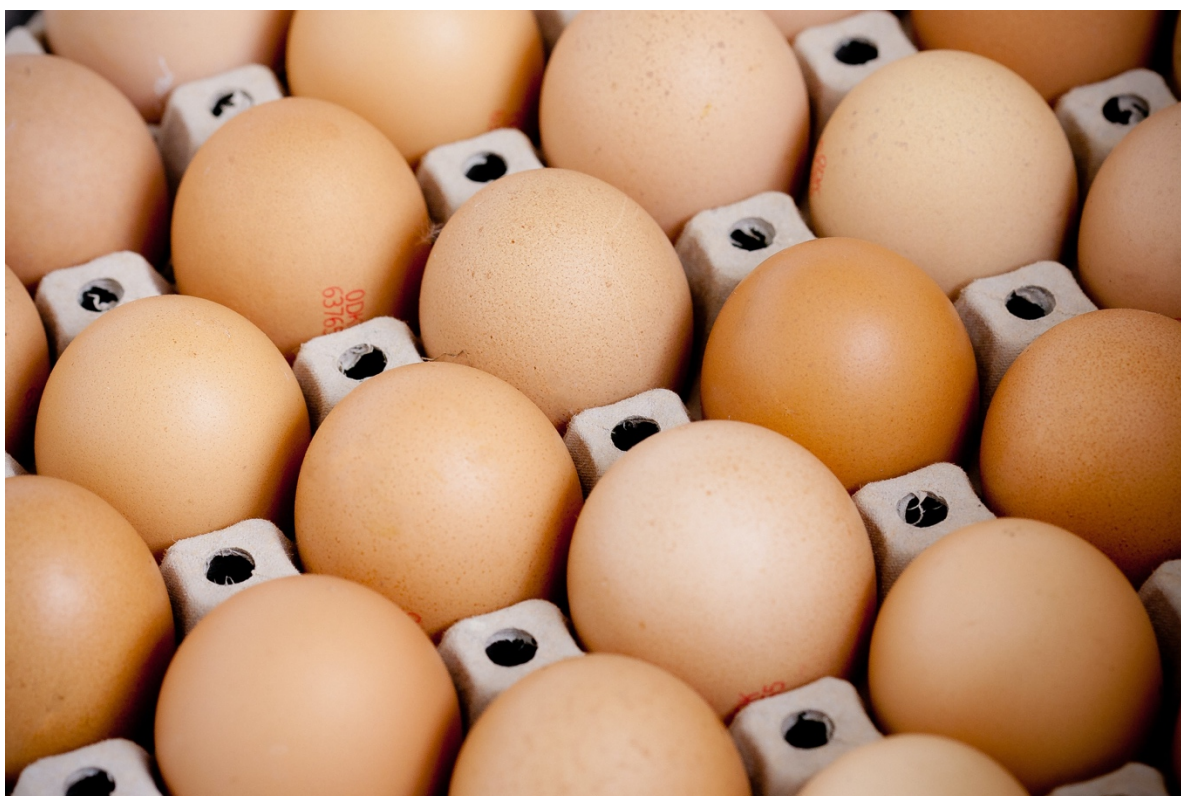


VALUE CHAIN ANALYSIS AND MARKET ASSESSMENT FOR EGGS IN MOZAMBIQUE

APPLICATION OF THE SUPPLY CHAIN ANALYSIS FOR NUTRITION (SCAN) TOOL



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SUMMARY

Despite Mozambique's economic growth over the last decade, critical levels of stunting amongst the population persist, partly driven by inadequate nutrient intake. Eggs are an excellent and affordable source of protein and represent an opportunity to address nutritional deficiencies in the Mozambican population. African egg consumption is about 40 eggs per person per year, while Mozambicans consume only four eggs per year per capita. This briefing paper presents a supply chain analysis for eggs in Mozambique, with a focus on the barriers and possible mechanisms for scaling.

The results show that the main constraints in the egg value chain in Mozambique include: (1) the high cost of feed, (2) the high cost of pullets, (3) difficulty accessing day-old chicks for pullets, (4) uncontrolled importation of eggs from neighbouring countries, (5) limited experience with commercial production of eggs, (6) unstable electricity supply, (7) high financing costs, and (8) volatile exchange rates. There are certain opportunities for the private sector within the Mozambican egg supply chain, namely domestic market expansion, increased usage of domestically produced maize and soya for feed, producing and selling day-old layer chicks or pullets, and leveraging a favourable regulatory environment for the importation of birds and essential equipment and inputs.

KEY MESSAGES

- In Mozambique, stunting and micronutrient deficiencies are widespread: 69% of children under five are anaemic, and 74% are vitamin A deficient, and 42.6% are stunted.
- Eggs are an excellent and affordable source of protein and other key nutrients, with long shelf lives compared to other animal-source foods.
- Mozambique's egg production reached 13 million dozen eggs in 2017, with 60% of eggs consumed coming from imports.
- Key barriers affecting the consumer side of the value chain are low availability in rural markets, confusion about the colour of shell and yolk in determining nutritional value, and the quality of inputs, which affects nutritional output.
- Recommended actions for the private sector include: (1) improve cooperation and coordination amongst the various actors along the value chain, (2) increase the use of domestic maize and soya to reduce the cost of feed, (3) study the feasibility of investing in the production of pullets at the local level, and (4) collaborate with the government in the identification of training packages to enhance local human resources capacity to effectively work in this value chain.

BACKGROUND AND OBJECTIVE

Despite Mozambique's economic growth over the last decade, critical levels of stunting persist amongst the population, affecting 42.6% of children under five years of age, with little change over the last decade (1). Micronutrient deficiencies are widespread; for example, 74% of children under five are vitamin A deficient, with negative impacts on growth, immunity, and development (2). Eggs are an excellent and affordable source of animal protein and have been identified as a key food to address nutritional deficiencies. Worldwide egg consumption is about 150 eggs per person per year, while in African countries per capita annual consumption is around 40 eggs (5,6). However, Mozambicans on average consume only four eggs per year (6). Increasing egg consumption in Mozambique could thus improve intake of the nutrients needed for people, communities, and economies to be stronger and healthier.

To inform policy options for doing this, this briefing paper presents a supply chain analysis for eggs in Mozambique, with a focus on the barriers and possible mechanisms for scaling. The analysis uses the Supply Chain Analysis for Nutrition ([SCAN](#)) tool, which was developed by the Global Alliance for Improved Nutrition (GAIN) for analysing specific supply chain weaknesses or bottlenecks and suggesting potential mechanisms to improve nutrition along the supply chain (3). Using the SCAN tool, this analysis builds upon a value chain analysis and market assessment completed by KPMG for GAIN (4). The analysis was based on desk review, secondary data analysis, field visits and interviews with key actors in Maputo, Manica, and Nampula.

FINDINGS

CHARACTERISTICS OF THE FOOD ENVIRONMENT

The key characteristics of eggs within the food environment (i.e., accessibility, desirability, and quality) are outcomes of the supply chain, in interaction with the broader food system in Mozambique. These characteristics shape consumers' decisions around egg acquisition, with implications for their nutrition.

Accessibility: While eggs are generally available in urban markets, they are difficult to find in some rural areas. This creates an opportunity for small-scale farmers to increase rural supply, provided the constraints of chick and pullet supply, feed supply, and power access could be overcome. For example, if small producers in rural areas do not have access to reliable power supply, birds will cease production in autumn due to lack of enough light hours amid shortened days.

Desirability: Mozambican consumers prefer a bright-yellow yolk, as opposed to a pale-yellow yolk. Consumers generally reported imported eggs having better yolk colour than nationally produced eggs; they are therefore seen as being tastier and having a longer shelf life. However, yolk colour has no influence on an egg's nutritional quality or shelf life, indicating a lack of awareness and understanding amongst consumers. Pale-yellow yolks are a result of local feed suppliers not having yellow maize available for mixing into poultry feed (only white maize is produced), but this can easily be corrected by the addition of carotenoids, as is done in Zambia and Malawi. Egg shell colour, determined by the breed of bird being used, also influences consumer preference. Consumers prefer brown-shelled eggs to white-shelled eggs. However, there is no nutritional difference between brown- and white-shelled

eggs. Consumer attitudes and preferences could be influenced by educational and publicity campaigns, provided the quality of domestically produced eggs is comparable with imported products.

Quality: Eggs are the cheapest source of high-quality animal protein in the Mozambican market. The shelf life of eggs also makes them a more attractive protein source relative to meat and fish as there is less need to keep eggs refrigerated. As mentioned above under the desirability section, the perception of quality is determined by egg yolk and shell colour, yet this is not necessarily an indication of the nutritional content. The amount and nutritional quality of eggs produced are, however, affected by the poultry feed quality, water provided to poultry, and veterinary services.

Key barriers affecting the consumer side of the supply chain, particularly related to accessibility, desirability, and quality of eggs, are low availability in rural markets, confusion about the colour of shell and yolk in determining nutritional value, and the quality of inputs and its effects on nutritional output.

MARKET ASSESSMENT AND SUPPLY CHAIN MAPPING

In Mozambique, egg production reached 13 million dozen eggs in 2017 (8). Domestic egg production is dominated by three companies: Mozambique Fresh Eggs ($\pm 90\%$ of domestic eggs produced in the North), Abílio Antunes ($\pm 95\%$ of domestic eggs produced in the Centre), and Galovos ($\pm 85\%$ of domestic eggs produced in the South) (4). More than half of total production is in the south, mainly due its proximity to the major feed mills and to South Africa, which is the main source for pullets, veterinary medicines, feed concentrates, and equipment for the egg production industry (4). 60% of eggs consumed in Mozambique are imported (4). Of the eggs produced in-country, around 96% are commercially produced (Figure 1).

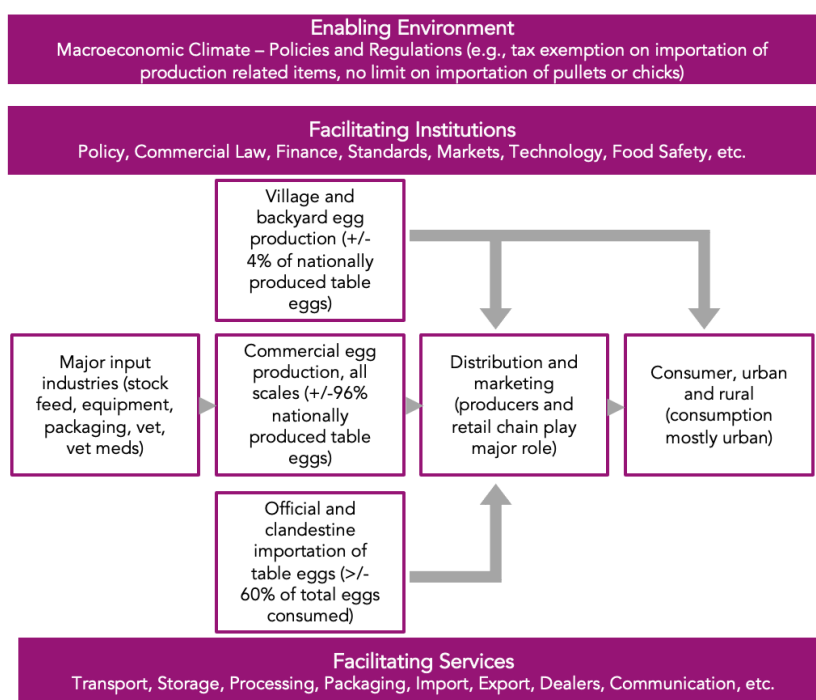


Figure 1: Supply chain mapping of the egg value chain in Mozambique (4).

EGG VALUE CHAIN CONSTRAINTS AND OPPORTUNITIES

An analysis of the major strengths, weaknesses, opportunities, and threats (SWOT) at the various parts of a simplified egg production value chain in Mozambique showed weaknesses in inputs (e.g., day-old chicks, feed supply) and inadequate support later in the value chain (e.g., veterinary and technical support) (Figure 2).

STRENGTHS			
Suitable climate and land for production of maize and soya; low labour costs		Low labour costs; sustained economic growth	Growing market for eggs in Mozambique
WEAKNESSES			
Fragmented, widely disbursed small-holder sector; few commercial farmers; lack of grain storage facilities; poorly coordinated marketing; long distances and poor roads; import of feed raw materials and all essential equipment; no national pullet chick production; poorly trained work force; inadequate extension service		Uncompetitiveness with neighbouring countries due to high production costs, especially feed and pullets; no government subsidies on fertilizer, feed or other essential production inputs; unrestricted import of eggs, pullet chicks, point-of-lay pullets; clandestine import of eggs, national skills shortage in egg production industry	Poorly developed distribution and marketing chains except for major producers and large retailers; degraded roads; inadequate cool chain to ensure maximum shelf life
PRE-PRODUCTION SUPPLY & INPUTS	→	PRODUCTION	→ DISTRIBUTION AND MARKETING
OPPORTUNITIES			
Subsidise fertilizers and make them more available to increase maize yields; (use gas for fertilizer production); improve grain storage at provincial and district level, quality control; increased production of maize and soya; grain marketing cooperatives; develop the soya value chain; establishment of breeding farms for the production and rearing of pullet chicks in Mozambique		Control, limit and tax the entry of imported eggs; greater producer coordination; cheaper loans/finance to encourage new producers or expansion; greater use of nationally produced maize and soya in feed; favourable regulatory environment for import of stock and essential equipment and inputs; rapid market growth	Growing market for and increasing consumption of eggs; enormous market potential, consumption of eggs per capita is the lowest in Southern Africa
THREATS			
Climate change threat to national and regional agricultural production		Extremes of climate (heat); diseases (e.g. Avian flu) clandestine importation of eggs; volatile exchange rate fluctuation; unreliable electricity supply; water shortages	VAT on 2nd transaction; clandestine imports continue to undermine national competitiveness in regional markets

Figure 2: SWOT analysis of simplified egg value chain in Mozambique (4).

KEY BARRIERS

The main constraints identified in the egg value chain in Mozambique include: (1) the high cost of feed, (2) the high price of pullets, (3) difficulty accessing day-old chicks for pullets, (4) uncontrolled importation of eggs from neighbouring countries, (5) limited experience with commercial production of eggs, (6) unstable electricity supply, (7) high financing costs, and (8) volatile exchange rates.

OPPORTUNITIES

Despite the previously mentioned constraints, the market presents some opportunities for the private sector:

- **Potential for domestic market expansion** – egg consumption in Mozambique is extremely low compared to neighbouring countries. However, demand for eggs is likely to increase due to the growth of the urban population.
- **Potential to use more domestically produced maize and soya for feed production** – egg producers that produce their own feed can reduce production costs by 25% compared to those buying from commercial feed producers.
- **Potential to produce and sell day-old layer chicks or rear and sell pullets** – Mozambique is dependent on sourcing layer chicks from South Africa, Zimbabwe, Malawi, and even the European Union. The reliable supply of day-old pullet chicks is thus a major constraint for scaling up production in Mozambique and poses an opportunity.
- **Favourable regulatory environment for importation of stock and essential equipment and inputs** – the importation of stock feed and essential equipment for the egg production industry is exempt from import duties, but costs are generally high due to exchange rate volatility. The larger egg producers, who regularly import these inputs, report that the bureaucracy and time involved in the process have been significantly reduced.
- **Limit the importation of eggs and stock to cover just the deficit of national production** – currently there is no limit on importations of eggs. There is an opportunity for the major producers to improve collaboration, e.g., through the Mozambican Poultry Association or an association of industrial scale producers that is currently being created. The idea is for major producers to meet twice a year, calculate their combined production potential in the upcoming six months, calculate estimated market demand for that period, and from this information, estimate the deficit in national production that should be covered by imports.

RECOMMENDATIONS

In order to seize the existing opportunities in the market, the private sector is recommended to: (1) improve cooperation and coordination among the various actors along the chain through the Mozambican Poultry Association or other possible associations, (2) increase the use of domestic maize and soya to reduce the cost of feed, (3) study the feasibility of investing in the production of pullets at the local level, and (4) collaborate with the government in the identification of training packages to enhance local human resources capacity to effectively work on this value chain.

For the government, the following actions are recommended: (1) civic education campaigns on the value of eggs in the human diet, (2) improving border controls on imported eggs, (3) possibly

reviewing of the application of Decree 56/2011¹, (4) strengthening the capacity of veterinary laboratories, (5) providing specific vocational training for the poultry sector, and (6) disseminating efficient and low-cost techniques for storage of agricultural products to farmers through national extension services or other arrangements.

For development organisations, it is recommended to: (1) directly support medium and small producers to expand their businesses; (2) advocate with government to improve the application of Decree 56/2011; and (3) cooperate with government and the private sector on campaigns on the benefits of egg consumption.

CONCLUSIONS

While consumption of eggs in Mozambique is low compared to other African countries, demand is expected to rise. Increased consumption could have benefits for nutrition. The key barriers to the scale up of egg production in Mozambique are mostly related to inputs into the value chain and the regulatory environment. These include high cost of feed, high price of pullets, difficulty accessing day-old chicks for pullets, uncontrolled importation of eggs from neighbouring countries, unstable electricity supply, high financing costs, and volatile exchange rates.

Key opportunities lie in developing local production of eggs and the inputs required for this; the use of domestic maize and soya to reduce the cost of feed presents a particularly key market opportunity. The government can play an important role by limiting the importation of eggs and improving infrastructure, such as by financing storage facilities.

¹ The objective of Decree 56/2011 is to limit the marketing margins on basic food basket items, which include eggs, to ensure that the consumer can purchase necessities for an affordable price. In the case of eggs (and poultry meat), the exemption from VAT applies only to nationally produced eggs, not imported eggs. The decree, therefore, in theory, offers a degree of protection to the Mozambican industry. However, in practice, the way that the Decree is being interpreted and applied does nothing to protect the Mozambican industry nor guarantee affordable prices for consumers. The application of VAT on the second transmission increases the final price of eggs produced locally. Since the price of imported eggs tend to be lower, the demand for locally produced eggs may drop.

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