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FOR ANIMAL RESOURCES

LiVe2Africa
Sustainable Development of Livestock for Livelihoods in Africa

EUROPEAN UNION

Assessment of the Chicken Egg Value Chain in ECCAS Member States

(Cameroon, Chad, Democratic Republic of the Congo, Gabon, and Republic of the Congo)



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List of Abbreviations

AFD	French Development Agency
AFDB	African Development Bank
AGID	Autoimmune Gastrointestinal Dysmotility
AU	African Union
AU-IBAR	African Union's Inter-African Bureau for Animal Resources
CA-GPSF	Central Africa Poultry Grand-Parent Stock Farm
CA-PEVC	Central Africa Poultry Egg Value Chain
CPDE	Professionals for the Development of Livestock
DGPR	Directorate General for Risk Prevention
DRC	Democratic Republic of the Congo
DRCA	Discounted Cash flows
DRR	Disaster risk reduction
ECCAS	Economic Community of Central African States
EOC	Emergency Operations Center
FAO	Food and Agriculture Organization
FSA	Farm Security Administration
GIS	Geographic Information System
GP	Grand Parent
H5N1	Hemagglutinin Type 5 and Neuraminidase Type 1
HACCP	Hazard Analysis Critical Control Point
HPAI	Highly pathogenic avian influenza
IDA	International Development Association
IFAD	International Fund for Agricultural Development
IFI	Intensive Family Intervention
IP	Profitability Index
IRR	Internal Rate of Return
IT	Information Technology
LC	Lead-Consultant
LDVB	Diagnostic Laboratory Veterinary surgeon of Brazzaville
LT	Long Term
MT	Medium Term
NCs	National Consultants
NGO	Non-Governmental Organization
NPV	Net Present Value
OIE	World Organisation for Animal Health
ONMVC	National Order of Veterinary Doctors of Congo
PCR	Polymerase chain reaction
PEVC	Poultry Egg Value Chain
PNSA	National Food Security Programme
PPP	Public-private partnership
QHSE	Quality, Management, Health, Safety and Environment
RECs	Regional Economic Communities
SA	Strategic Actions

SGMP	Simple Gateway Monitoring Protocol
SOP	Standard Operating Procedure
SPSS	Statistical Package for the Social Sciences
ST	Short Term
TOR	Terms of reference
UNDP	United Nations Development Programme
WCR	Working capital requirements
ACEFA	Program for the Improvement of the Competitiveness of Agropastoral Family Farms
CEBEVIHRA	Economic Commission for Cattle, Meat and Fishery Resources
CEMAC	Central African Economic and Monetary Community
COBAC	Central African Banking Commission
CODDIPA	Food Development and Distribution Authority
COVID-19	Corona Virus Disease 2019
DAOA	Foodstuffs of Animal Origin
ELISA	Enzyme-Linked Immunosorbent Assay
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
IPAR-CEMAC	Regional Poultry Interprofessional
IPAT	Poultry Interprofession of Chad
IPAVIC	Poultry Interprofession of Cameroon
IRED	Institute for Livestock Research for Development
LANAVET	National Veterinary Laboratory
LiDeSA	Livestock Development Strategy
LIVAS	Livestock Value Chain Data Analysis
MINEPAT	Ministry of the Economy, Planning and Regional Development
MINEPIA	Ministry of Livestock, Fisheries and Animal Industries
PACA	Agricultural Competiveness Project
PACE	Electoral Cycle Support Project
PNVRA	National Agricultural Research and Extension Program
PRODEL	Livestock Development Project
PRODER SUD	Rural development project
REPIMAT	Animal Disease Epidemiological Surveillance Network of Chad
RESCAM	Animal Disease Epidemiological Surveillance Networks
SISAAP	Food Security Information and Early Warning System
SWOT	Strengths, Weaknesses, Opportunities, and Threats
UEAC-CEBEVIRHA	Economics Community of Livestock, Meat and Fishery Resources
UGAPROT	Union of Professional Poultry Farmers Groups of Chad

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Executive summary

The African Union Inter-African Bureau for Animal Resources (AU-IBAR) implemented a 5-year project titled "Sustainable Livestock Development for Livelihoods in Africa – 'Live2Africa', a pioneer project with has a coherent continental program approach to building systemic capacity in seven livestock components namely: Investing in livestock value chains; Animal health; Animal production, Productivity and ecosystem management; Building resilience; Adoption of technology; and institutional capacity building. This report is as a result of an assessment of the state of the poultry egg value chain (PEVC) in Central Africa, with the goal of developing the poultry Sector by strengthening the inter-professional network (s) in Economic Community of Central African States- ECCAS.

In Central African countries, the poultry sector, particularly the chicken egg value chain, plays an important nutritional, economic and socio-cultural role.. The sector is based on two production systems: the traditional system and the modern system. The flock of laying hens in the region is unevenly distributed among countries. There are several issues within the chicken egg value chain.One of the critical points in the poultry egg value chain is theprovision of inputs especially day-old chicks, is. The production of day-old chicks is twofold:

i. Production of day-old chicks from local parent farms
ii. The production of day-old chicks from hatching eggs and imported day-old chicks.

There are approximately 71 mother farms and 29 hatcheries in Central Africa, there are around. Cameroon has approximately about 96% and 79% of these two types of infrastructure respectively, with a hatching potential of about three million day-old chicks per week. The measures taken to contend the COVID-19 have severely impacted the production of day-old chicks in Central Africa by the rupture of supply circuits and the closure of production units as in Congo Brazaville.

In Central African countries, several organizations coexist except for those in Congo Brazzaville and Gabon which revolve around country's main cities, and are mostly national in scope. Two actions can be taken to strengthen the institutional components of the poultry sector:

1. Support the creation of a national interprofession (Gabon, DRC, Congo) and strengthening the regional interprofession (IPAR-CEMAC);
2. Reinforcement of national, regional inter-professional and organizational equipment and material.

The analysis of the regional avian disease control system identified the following actions:

- Densification of the epidemiological surveillance network;
- Improvement of the biosecurity level of farms.

Introduction

1.1 *Context:*

The African Union's Inter-African Bureau for Animal Resources (AU-IBAR) has a specialized Technical Office for the Department of Rural Economy and Agriculture of the African Union Commission. Its mandate is to support and coordinate the sustainable development and utilization of animal resources (livestock, fisheries, and wildlife), to enhance nutrition and food security and contribute to the wellbeing and prosperity of the people in the Member States of the African Union (AU). AU-IBAR accomplished its mandate through supporting and empowering the AU Member States, the Regional Economic Communities (RECs), and other stakeholders in the livestock sector.

As part of providing leadership and coordination in the sustainable development of the continent's Animal Resources, AU-IBAR implemented a 5-year project on "Sustainable Development of Livestock for Livelihoods in Africa - Live2Africa". The project pioneered a coherent continental program approach on building systemic capacity in seven livestock components that include: Investment in Livestock Value Chains; Animal Health; Animal Production, Productivity, and Ecosystem Management; Resilience Building; Technology adoption; and strengthening institutional capacities. One of the projetc's main goal areas was to enhance the implementation of breeding and conservation programs for sustainable utilization and management of African livestock. Live2Africa was a concrete support for the implementation of the Livestock Development Strategy (LiDeSA), through the Value Chain approach.

The prioritization exercise of the regional livestock value chains that had been carried out in a consultative meeting in Nairobi, Kenya in February 2019, indicated that the Poultry Egg Value Chain (PEVC) is identified as the priority for Central Africa. A stakeholder stocktaking exercise to define intervention areas along the selected priority livestock value chains, was carried out in August 2019 in Cairo, Egypt. Participants from the Central-Africa Member States identified the strategic actions (SA) and interventions (in Table 1).

Implementation of prioritized strategic actions and interventions by the Live2Africa, shall contribute to Central Africa's poultry sector, by strengthening the systemic capacity of national and regional Poultry Egg Value Chain (PEVC) for the economic, environmental and social transformation, as aligned to the Livestock Development Strategy for Africa (LiDeSA).

Table 1: *List of ECCAS identified regional strategic actions (SA) and interventions*

Central Africa Priority Value Chain: Poultry Value Chain
Strategic Actions (1). **Strengthening the Policy and Regulatory Framework**
1.1. Develop a regional poultry development policy (Harmonize the sub-regions regulations on poultry farming, control the price of products and inputs, and establishment of a quality control structure in the sub-region) 1.2. Supporting the development of regulations and standards
Strategic Actions (2). **Improvement of the poultry value chain**
2.1. Identification, mapping, synergizing input and poultry producers, and promote the establishment of a sub-regional grand-parent lines/stock farm.
Strategic Actions (3). **Capacity Building**
3.1. Establish/strengthen the inter-professionals network at the national and regional levels.

This report is a result of a consultative process aimed at providing a platform to assess the current status of Central Africa Poultry Egg Value Chain (CA-PEVC), and strengthening the Inter-Professionals Network(s) in ECCAS.

1.2 *Objectives of the Consultation Missions*

The overall objective was: "To assess the current status of the national Poultry Egg Value Chain (PEVC); its supporting programs/initiatives implemented since the year 2000; and mapping of its input/output actors in the participating five Member States of Central Africa (Cameroon, Chad, the Democratic Republic of the Congo, Gabon, and Republic of the Congo); in addition to conducting a feasibility study and developing the road map for the establishment of the Central Africa Grand-Parent Stock Farm (CA-GPSF) and strengthening the Inter-Professionals Network(s), to improve productivity, resilience, and sustainability of the regional PEVC."

The specific objectives of the Consultancy:

1. To describe the Baseline status of different segments of the national Poultry Egg Value Chain (PEVC), including the national developmental objectives.
2. Mapping of main national and regional PEVC actors, assessment of their function, and the road map for strengthening the Inter-Professional Networks function in the management, productivity, and resilience of the regional PEVC.
3. To assess the national and regional PEVC resilience to the biotic/abiotic (re)emerging disasters (particularly the impact of the current Covid-19 confinement restrictions), gaps, and needed interventions to fill the gaps.
4. Inventory of the supporting programs/initiatives (e.g. genetic gain system, poultry products value-add programs, poultry stakeholder networking, etc.), that have been implemented since the year 2000) on both national and regional levels, their impacts, gaps left, and opportunities to fill the gaps.
5. Road map for the establishment of the pilot regional Central Africa Grandparent Stock Farm (CA-GPSF), to be implemented by Live2Africa, its expected impact, and the best implementation and partnership modalities to support productivity, resilience, and sustainability of the regional PEVC.

1.3 Methodology

The methodology of the consultation process included Desk (literature, official census, and database) reviews, individual interviews, and group discussions with stakeholders and strategic actors of different segments of the PEVC (producers, traders, processors, input suppliers, professional organizations, researchers and education staff, public sector, etc.). It was also all about analysing of quantitative data and qualitative observations in proper approaches to achieve the objectives of the study. The group discussion meetings were in the form of online conferences, to cope with the current Covid19 confinement restrictions and the individual interviews were done in physical meetings taking into consideration social-distance measures or through online meetings. Data collection was made using a survey that could be filled online or in interviews. Data analyses was done using an application developed for this type of work called: Livestock Value Chain Data Analysis (LIVAS). The criticism index was used to analyse the risk data. Data was also analys using EXCEL, SPSS 20.0, and QGIS 3.14.16 'Pi'.

1. DESCRIPTION OF THE POULTRY SECTOR

The global aspect of the poultry sector

1.1 Socio-economics importance of PEVC with emphasis on the day-old chick supply chain

The poultry sector plays an important nutritional, economic and socio-cultural role in Central African countries. Two production systems coexist. The traditional system, implemented rather by rural households, contributes enormously to the sphere of exchanges between families and friends (gifts, dowries, confessions, ceremonies, and receptions, etc.), food security, and ritual sacrifices (Dronne, 1969; Mopaté et al., 1995; Mopaté et al., 1997b; Mopaté and Lony, 1998; Mopaté et al., 1999b). It consists mainly of village chickens, ducks, guinea fowl, pigeons, and some geese. While the modern, more urban, or peri-urban system helps to cover the urban demand for chicken and mainly eggs. Modern farms are of various sizes. Nevertheless, their number varies from one country to another. Indeed, apart from Cameroon, which has a dense poultry production fabric, countries such as Chad, Gabon, and Congo Brazzaville and the Democratic Republic of Congo have very few structures, from about one in Gabon to just over ten in Congo Brazzaville. In the improved production system, the share of young people and women is reduced in favor of men. Factory farms engaged in egg production employ a good number of young people (Njossu, 2019). Poultry production provides substantial income and helps to cover the small daily expenses for health care, daily consumer goods (tea, sugar, soap, oil, condiments, etc.) needed by households. (Mopaté et al., 1995; Mopaté and Lony, 1998).

The poultry egg-laying population is unevenly distributed between countries. The following table shows the numbers of poultry laying and the number of eggs in 2019/2020.

Table 2: *Inventory of poultry populations laying eggs in 2019/2020*

Country	Number of layers	Quantity of egg (tons)
Cameroon	5 956 685	96 737
Chad	160.000	3 200
Gabon		43626
DRC		
Congo Brazzaville	400 000	5 280
Total	**6 356 685**	**148 843**

Source: *Compilation of national and FAOSTAT reports.*

These values are dependent on the level of development of the local supply chains for poultry genetic material (day-old chicks or hatching eggs). Most countries have a variable national production base of day-old chicks.

1.2 Policy and regulatory frameworks with an emphasis on the day-old chick supply chain

Each Central African country has a strategic plan for economic development. They are broken down into sectoral plans (livestock, rural, etc); examples include:

- Common Agricultural Policy for Central Africa
- National Development Plan for Agriculture and or Livestock of the different countries;
- National Livestock Development Plan for the period 2017-2021 of Chad.
- Rural sector development strategy 2020-2030 of Cameroon ;
- Agriculture development strategy of Gabon.
- Agricultural code of Gabon ;

These national strategies in their conceptions, are in sync with the political establishment of a regional and continental free trade area. Its application is still ineffective, particularly in the Central African region. In fact, for livestock products such as day-old chicks, cross-border movements are rigorously regulated by national texts which seem to take precedence in push for health protection. Moreover, the production and conservation of animal seeds are not very visible in these different texts. There is a clear weakness in the legal texts that draw animal seeds into the midst of livestock products, with a perception of factors for the spread of animal diseases instead of a strategic site for the development of the commodity chains and independence. The following table presents some texts that regulate animal movements.

Table 3: *Some regulatory texts and policy framework in Central Africa related to the production and distribution of day-old chicks*

Policy and regulatory frameworks	Description of policy / regulatory frameworks	Stakeholders	Country/zone
Regulation 09/17-UEAC-CEBEVIRHA	governing the health and safety of animals, food, and products of animal and fishery origin in the CEMAC zone;	Member states, value chain actors	CEMAC
Decision n°0028/MINEPIA of 17 March 2006, modified by Decision n° 00164/MINEPIA of 25 July 2006	Suspending the importation of certain animal species susceptible to Highly Pathogenic Avian Influenza (Avian Influenza) and certain types of breeding material	Government, value chain actor	Cameroon
Ordinance No. 2126/PR/PM/16 of 28 June 2016, Ordinance N°034/PR/PM/ME/SG/DGSV/16 of 31st May 2016	creation of an ad hoc inter-ministerial committee for the prevention and control of avian influenza in Chad precautionary measures against the introduction of avian influenza into Chad	Government, value chain actor	Chad
Ordinance N° 17/025 of 10 July 2017	setting out the remit of ministries such as the Ministry in charge of Livestock	Government, value chain actor	DRC
Ordinance N°4646/BE47-14 of 16 December 1968	Regulation of the importation of live animals into the Republic of Congo	Ministry in charge of Livestock, Ministry of Commerce, Ministry of Finance, Ministry of the Interior, Ministry of Public Health, Actors in the Livestock sector, Actors in the sector	Congo Brazzaville
Law n° 022/2008 of December 10, 2008, establishing the Agricultural Code in the Gabonese Republic.	regulates the livestock sector regulates the import and export of livestock products	Government, value chain actor	Gabon

From text analysis as opposed to the strategies, there remains a perception of epidemiological unity at the country level. This is evident following the recent bird flu (avian influenza) crisis, so the lifting of barriers remains tcautious. Day-old chick distribution channels are still hampered at the regional level by sanitary barriers. Segregation between countries has become more pronounced as a result of the measures taken in response to the COVID-19 pandemic, such as the relatively effective closure of borders.

1.3 *Areas in need of policy development or update*

The following table presents the areas with strategic axes in favor of the development of increased production of day-old chicks in the ECCAS zone.

Table 4: *Area in-need policy development update*

Areas requiring policy/regulatory development/ updating Description of updated policy and regulatory frameworks	**Description of the updated policy and regulatory frameworks**
Development of production and distribution of animal genetic resources and quality feed inputs	Development of a regional charter for the animal (poultry) seed production Update/harmonization of national texts governing the production, conservation, and transport of animal (poultry) seed; Development/harmonization of measures related to the control and quality assurance of inputs and compound feeds for poultry in the ECCAS zone; Implementation of incentive measures for the development of animal seed production, i.e., the development of the production of animal seeds: • Promote the elaboration and periodic updating and implementation of risk and disaster management plans (particularly in animal health) by the territorial epidemiological unit of interest depending on the country; • The development of a quality labor force for animal seed production (day-old chicks) • Reduction of customs duties on animal seeds (day-old chicks) in the ECCAS zone Setting up a Central African fund for the development of animal seed production
The promotion of professional and interprofessional organizations in agricultural production chains	Updating the texts on the rights of associations in connection with the professional sectors in animal husbandry/agriculture. Establishment of a regional framework to support supranational organizations in connection with animal sectors.
Strengthening the regulation of animal disease control systems at the regional level	Harmonization of the national texts of the 10 ECCAS countries in the field of health protection The establishment of a regional EOC that governs national EOCs The establishment of a regional SOP for the management of epizootics

1.4 *Mechanisms for the financing of the supply chain of day-old chicks*

The poultry sector in the study area has benefited from several funding programs over the last 20 years. Following the economic crisis of the 1980s, under the aegis of the Bretton Woods institutions, the Central African states gradually withdrew from the production machine to take on the position of the regulator. As a result, the mechanisms for financing commodity chains have evolved to promote the private sector. Measures such as direct financial and material support.

Indeed, the preponderance of the state in the financing of the poultry sector remains present in different countries. Examples of financing through projects and programs are the manifestation of this.

Financial institutions invest little in the agricultural sector (Njossu, 2019). The low level of credit by banks to the poultry sector, and more specifically the production of day-old chicks, depends on the risky nature of this activity concerning the zoo-sanitary situation. Thus, the conditions of access to credit for breeders are particularly onerous. Despite the existence of special funds dedicated to rural sector finance in countries such as Congo Brazaville, actors resort to alternative mechanisms stemming from solidarity finance. Indeed, the procedures for granting finance are often long and difficult. The following table shows the different financing mechanisms used in poultry and day-old chick production in Central Africa.

Table 5: *Mechanism for the financing of the supply chain of day-old chicks*

Types of financing poultry farming	Mechanisms for financing poultry farm	Stakeholders
Public finance	• Direct financial subsidies for poultry production (day-old chick production and hatching eggs...) • Revolving fund • Subsidised agricultural loans • Guaranteed agricultural loans • Shared-cost financing (State grant + beneficiaries' counterpart) • Support in productive assets	Government projects (PRODEL; FSA...) Technical and financial partners (AFDB, UNDP, FAO, World Bank...) Public investment budget of the ministries Special post-bird flu recovery fund for day-old chick producers A player in the poultry value chain
Private finance	Commercial finance Bank credit, Microcredit, Solidarity finance, Tontines Savings, and credit associations	Commercial banking Microfinance institutions Associations and co-operatives... Actors in the poultry value chain
NGO's finance	Support in productive assets Direct subsidies to poultry and day-old chick producers	NGO's Ministries Actors in of the livestock sector

Despite this great variability in financing methods and mechanisms adopted, access to financial resources remains a major impediment to the development of the poultry sector and the day-old chick supply chain. The following table presents the SWOT analysis of the financing of the day-old chick supply chain and the strategies to be implemented.

Table 6: *SWOT analysis of mechanisms for financing*

Opportunity	Strength	Weaknesses
	Existence of several financial institutions	Lack of suitable financial products provided by financial institutions. Traditional commercial banks invest little in the poultry sector, especially in day-old chick production in the different ECCAS countries. High-interest rate (10% per year) on loans granted by financial institutions
Government willingness to finance poultry farming (several Existence of several technical and financial partners Existence of COBAC Existence of national epidemic surveillance networks for animal diseases in target countries	Raising awareness of financial institutions on the benefits of poultry seed production	Development of new financial products suitable for poultry farming and animal seed production (day-old chicks) Establishment of a special guarantee fund for bank loans for animal seed production (day-old chicks).
Threats Recurrent epizootics Banks with excess liquidity Insecurity		Strengthen epidemic surveillance systems and support an insurance mechanism for poultry products.

List of strategies to improve mechanisms for financing

- Development of new financial products adapted to poultry farming and animal seed production (day-old chicks);
- Establishment of a special guarantee fund for bank credits granted for animal seed production (day-old chicks);
- Raising awareness of financial institutions on the gains related to seed production in poultry farming;
- Strengthen epidemic surveillance systems and back up an insurance mechanism on poultry products.

2. CURRENT SITUATION OF POULTRY EGG VALUE CHAIN

2.1 *Majors functioning segments and organization*

The poultry sector in Central Africa is relatively complex depending on the country. Nevertheless, it is still divided into three major functions (Production,Marketing,Transformation)

Within each link, a multitude of actors interact. Production is the most densely represented link. Within it, we can distinguish different types of producers: hatching egg producers, table egg producers. Except for Chad, all the countries linked to our study are producers of hatching eggs and day-old chicks. Close trade relations exist between the countries of Central Africa.

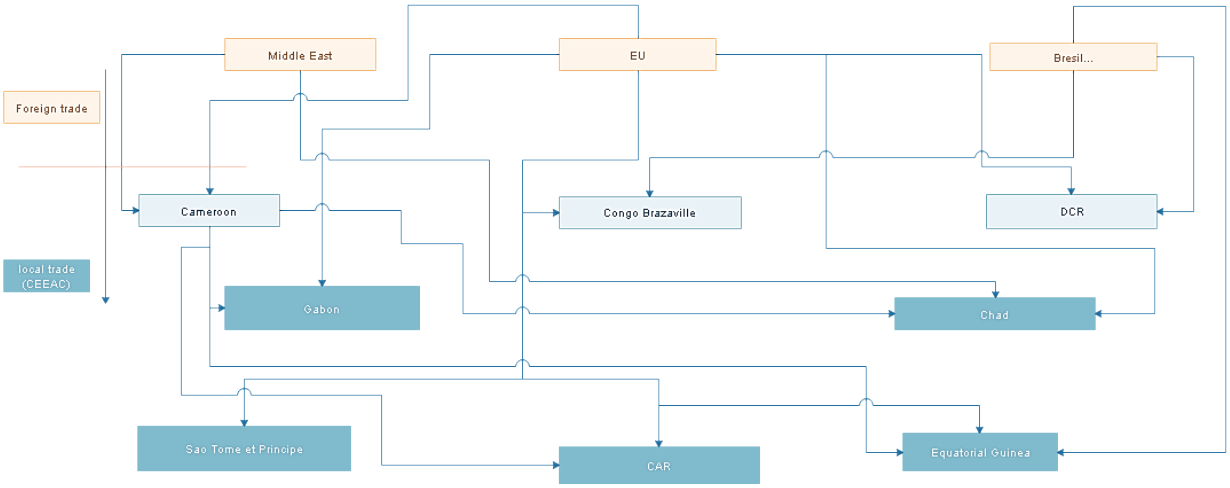


Figure 1: *Represented mapping of PEVC*
Source: *Njossu, 2019*

2.2 *Production*

2.2.1 *Day-old chicks*

The production of the chicks is of two (02) orders:

- The production of day-old chicks from local parent farms
- The production of day-old chicks from imported hatching eggs.

Table 7: *Features of parental farm*

Country	Number of parent farms	Hatchery
Cameroon	68	23
Chad	0	2
Gabon	1	1
DRC	1	
Congo Brazzaville	1	3
Total	**71**	**29**

In Central Africa, there are about 71 parent farms and 29 hatcheries. Cameroon has about 96% and 79% respectively of the 02 types of infrastructures. Parental production in Central Africa is unevenly distributed between countries. A potential of about 3 million days old chicks per week for hatching is available. The following table shows the capacities per country and the impacts due to COVID-19.

Table 8: *The capacity per country and the impact due to COVID-19*

Country	Number of parent farms	Maximum capacity of parent farms	The capacity of parent farms normally used	The capacity of parent farms during COVID 19
Cameroon	68	More than 3 000 000	1 163 400	Closure of 02 parental farms and Choking of 679,590 chicks
Chad				
Gabon	1		None	No impact
DRC	1		None	
Congo Brazzaville	1	3500	3500	
	No impact			
Total	**71**			

The capacity of the parent farms is under-exploited in the region. Nearly 50% of the potential is not developed. This under-utilization is due to market systems for poultry products that focus on the consumption of fresh products (meat and eggs). Besides, the parent production is mainly consumed in the environment close to the farm. Thus, the regional market represents a potential added value to the development of this market. In the year 2020, several parent farms (02 in Cameroon) and hatcheries (Chad) ceased their activities due to the depopulation of farms, restrictions, and contingency measures of the COVID 19 epidemic. Cases of smothering have been observed in Cameroon due to poor sales and cancellation of orders (679 590 chicks were smothered).

2.2.2 *Others products (Egg, Chick…)*

Egg and meat production are the main other products in Central Africa. Poultry production is dense around the main cities of all countries. In Chad, very few farms in the provinces are now operating because of losses due to poor husbandry. Specifically this year, several farms remain closed because of unfulfilled orders for day-old chicks due to the covid-19 pandemic. A drop in sales of eggs produced in Cameroon on the border with Chad has caused a significant drop in prices and cash flow problems for producers. Indeed, the psychosis created when animals are criminalized as reservoirs of the virus and the constitution of large stocks by households as soon as the announcement was made had a severe impact on the sector. Price variations were observed, for example, the price of broiler chicks fell from 500 to 350 or even 300 FCFA, and the price of a tray of eggs from 2200 to 1900 FCFA.

Production is supported by different types of producers:

i. Large Producer
ii. The producer of mean scale
iii. Small producers

In Chad, there are two table egg production farms of considerable size. While in Congo, there are about 10 major players. Gabon has only one against several hundred large producers. Near these large producers, several small producers gravitate independently of the country.

2.3 *Supply chain*

2.3.1 *Foreign trade*

Day-old chicks

Local production of day-old chicks in the ECCAS zone is relatively low. Despite existing trade between certain countries in the zone for poultry products such as day-old chicks, significant quantities come from imports from outside ECCAS.

Table 9: *Assessment of the number of imported chicks (2019-2020)*

	Importation 2019		Importation 2020	
Country	**Parental Day-old**	**Day-old chick**	**Parental Day-old**	**Day old chick**
Chad				
Congo Brazzaville	3400	275000	4032	120000
DRC		1100000		1500000

The European Union is the main import site for day-old chicks in the ECCAS zone. Also, Chad imports a large part of these products from Cameroon. Chicks are usually flown by air. Often converted vehicles are used for transport within ECCAS.

Other inputs

The following table shows the quantities of inputs imported during the years 2019-2020.

Table 10: *Assessment of imports of other inputs*

	Importations 2019		Importations 2020	
Country	**Soybean meal (T)**	**Veterinary drugs (T)**	**Soybean meal (T)**	**Veterinary drugs (T)**
Congo Brazzaville	753	132	431	80
DRC	250	30	250	32

2.3.2 *Organization of the supply chain*

Inputs

The cost of day-old chicks remains high in Central African countries; the cost of a laying day-old chick fluctuates around 1000 frs CFA per unit. Besides, the cost of the parental chick varies between 3500-6000 frs CFA.

Table 11: *Unit cost of a parental day-old chick and day-old chick per country*

Country	**Parental day-old chick**	**Day-old chick**
	Mean cost 2019	Mean cost 2019
Cameroon	3800	800
Chad	-	900
DRC	-	-
Congo Brazzaville	5570	950
Gabon	-	-

Alternative vehicles are the primary means of transportation for day-old chicks. We have identified 4 methods: Adapted trucks, Motorcycles, tricycles, Train.

Structures

Several structures contribute to the supply of feed inputs for poultry. Most of them are found in Cameroon.

Table 12: *Number of feed suppliers*

	Number of feed suppliers	Nombre en functions (2020)
Cameroon	Above 250	No data
Chad	1	1
DRC	-	-
Congo Brazzaville	4	4
Gabon	2	2

The following table shows the number of day-old chick suppliers working in 2020.

Table 13: *Number of day-old chick suppliers*

	Number of day-old chick suppliers	Number in function
Cameroon	68	66
Chad	2	1
DRC		
Congo Brazzaville	5	5
Gabon	1	1
Total	76	73

Agent

In the day-old chick supply chain, the agents in action are:

- Feed suppliers
- Days old chick suppliers
- Veterinary products suppliers
- Transport (river, road …)
- Equipment suppliers

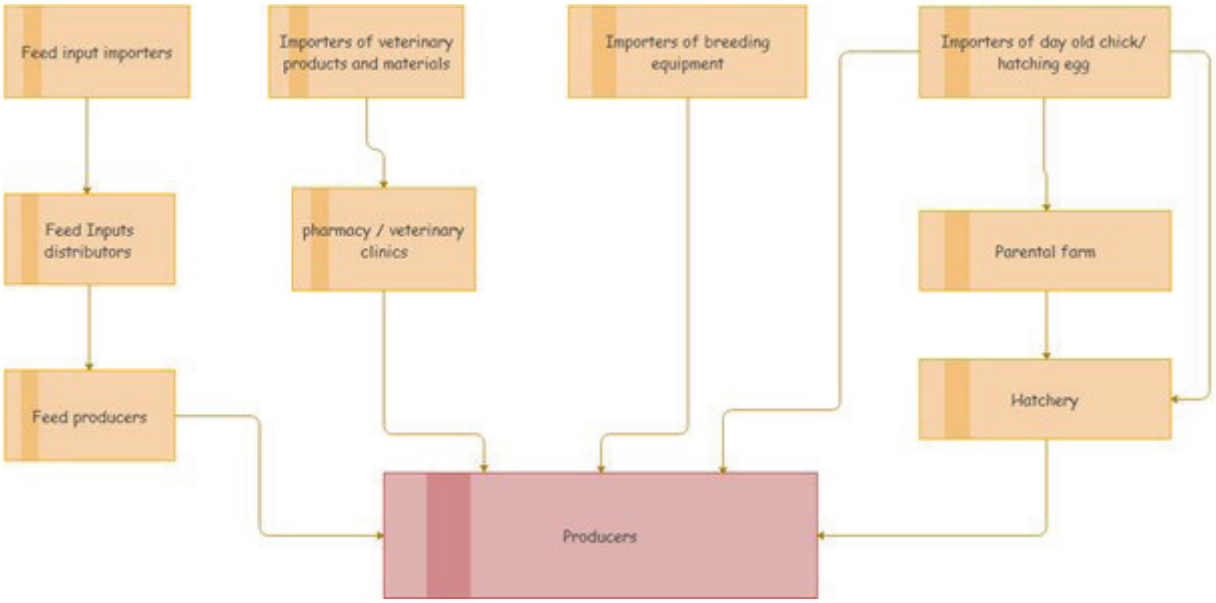


Figure 2: *Schematic representation of the organization of the supply chain and interconnections between the sub-sectors (food, veterinary products, etc.)*

2.4 *Trade analysis in PEVC*

2.4.1 *Trader characteristics*

There are three types of sales and distribution agents in the egg value chain: wholesalers and retailers. We can associate the itinerant/ambulant

Table 14: *Traders characteristics*

Country	Types de products	Types of traders	Number
Cameroon	Egg, hens	Wholesalers and retailers, ambulant	Undetermined
Chad	Egg, hens	Wholesalers and retailers, ambulant	510 (10% wholesalers, 75% retailers, and 2% street vendors
Congo Brazzaville	Egg, hens	Wholesalers and retailers, ambulant	Undetermined
DRC	Egg, hens	Wholesalers and retailers ambulant	Undetermined
Gabon	Egg, hens	Wholesalers and retailers, ambulant	Undetermined

It emerges from the table above that the majority of the markets of the sub-region have three main actors namely: wholesalers, retailers, and street vendors with eggs and chickens as sales products. However, there is difficulty in retrieving the numbers of the latter.

Table 15: *Main market and characteristics*

Country	Number of Main markets	Types of infrastructures
DRC	13	Disinfection park
Cameroon	112	Markets are constructed: • in permanent materials, • with office and toilet facilities, with storage facilities, • Cleaning and disinfection materials and products (Regional headquarters).
Chad	12	None
Congo Brazzaville	05	Markets are constructed: • In permanent materials, • with office and toilet facilities, with storage facilities. • Some markets are constructed with local materials without any toilet facilities.
Gabon	05	• Markets built with local materials, semi-hard and hard, with shops and toilets.

The majority of actors use local materials. The main pathways into markets are through lanes; rivers, air, roads, and rail however the road access seems to be the most used by the actors. The territorial network of veterinary services seems to be a brake on the distribution of products. Corruption and clientelism are designated as the reasons according to the actors. Moreover, this network remains insufficient to effectively hinder the spread of diseases. For external markets, corruption, customs, and health barriers seem to seriously hamper the distribution of products within the Region.

2.4.2 *Gap need interventions from Live2Africa link with PEVC improved*

Table 16: *Major constraints and some solutions*

Constraints of PEVC	Interventions from live2africa
Difficulty supplying day-old chicks	Creation of a day-old chick supply network in Central Africa (grandparent farm, parent farm, hatchery)
Scarcity of food inputs reinforced by the health crisis due to COVID 19	Creation of a security stock of inputs in Central Africa
	Support for the local production of cereals for cattle feed
Health and customs barriers hindering access to the Market	Strengthening of animal health prevention
Equipment deficit (breeding, transport, etc.)	

2.5 *Institutional organization*

Several structures coexist in the countries of Central Africa. They are mostly national in scope except for the structures of Congo Brazzaville which revolve around the main cities of the country. A regional structure, admittedly at half-mast, had been created to support and federate the efforts of the national interprofessional of the CEMAC zone. We distinguish:

- Cooperative of Professionals for the Development of Livestock (CPDE, Chad)
- Poultry Interprofession of Chad (IPAT, Chad)
- Union of Professional Poultry Farmers Groups of Chad (UGAPROT, Chad):
- Poultry cluster of Brazzaville and Pointe Noire (Congo, Brazzaville)
- Poultry Interprofession of Cameroon (IPAVIC, Cameroon)
- Regional Poultry Interprofessional-CEMAC (IPAR-CEMAC)

Table 17: *SWOT analysis with the added value of each organization in relationship with GPSF*

	Strength	**Weaknesses**
	Existence of national interprofessional which federate several members Existence of a regional interprofessional resulting from the regrouping of national structures	Difficulties in mobilizing the financial resources of national inter-professional organizations Weak organizational capacities of national interprofessional (democratic, management, etc.) Inactive regional interprofessional (low financial, infrastructural, and management capacity)
Opportunity	**Strength+ Opportunity**	**Weaknesses+ Opportunity**
The interest of the public authorities for the poultry sector (national and regional)		Support for the creation of a national inter-profession Reinforcement in equipment, material, and organization of national and regional interprofessional
Threats	**Strength+ threats**	**Weaknesses+ Threats**
Insecurity Corruption		

The table presents the activities for strengthening the interprofessional networks (national and regional level).

Table 18: *A roadmap for strengthening the Inter-Professional Networks*

Strategic actions	**Activities**	**Period**		
		ST	**MT**	**LT**
Support for the creation of a national inter-profession (Gabon, DRC, Congo) and reinforce the regional inter-profession (IPAR-CEMAC)	Creation/strengthening of a formal framework for multi-stakeholder national and regional consultation			
	Organization of workshop seminars to boost existing national and regional inter-professions			
	Development of a multi-year operational action plan for the implementation of the activities of existing national and regional inter-professional organizations			
	Drafting of a communication plan at national and regional level			
Reinforcement in equipment, material and organization of national and regional interprofessions	Training of executives / staff of inter-professional organizations (IT, GIS, organizational management, etc.) and equipment for national offices			

3. RISK AND DISASTER MANAGEMENT SYSTEMS RELATED TO POULTRY FARMING

3.1 *Analysis of regulatory texts/laws*

3.1.1 International texts and regulations

The World Organisation for Animal Health (OIE) is the reference organization for standards on animal health and zoonoses. It publishes two Codes (terrestrial and aquatic) and two Manuals (terrestrial and aquatic) which constitute reference texts in the field of animal health. The Terrestrial Animal Health Code and the Aquatic Animal Health Code aim to ensure the safety of international trade in terrestrial and aquatic animals and products derived therefrom. The Terrestrial Animal Health Code contains standards for the health of poultry and the marketing and transport of poultry and poultry products.

The provisions of the Code for terrestrial animals and which concern poultry are Chapters 1.1.2 (notification of animal diseases); 1.2.1 and 1.2.2 (trade); 1.4.3 (zoo health measures applicable at border posts in the importing country) and Title 2.7 on poultry diseases.

The OIE periodically updates its international standards as new scientific information emerges, following established procedures that are transparent and democratic. The only procedure for the adoption of a standard is through the approval of the World Assembly of Delegates, which meets annually at the OIE General Session.

- ***Regulation 09/17-UEAC-CEBEVIRHA*** governing the safety of animals, food and animal and fishery products in the CEMAC zone

The purpose of this Regulation is to lay down the general principles and institutional arrangements and procedures to ensure the protection of animal health and the safety of animals, food, and products of animal origin and feed placed on the market at the Community CEMAC level and at the national level. It also aims to achieve their free movement throughout the zone. It also aims to ensure veterinary public health in the CEMAC zone. A coherent and harmonized control system at the level of the CEMAC region is established to not only ensure a more fluid circulation of animals, food, and products of animal origin, as well as animal feed and products derived from biotechnology but also to protect the consumer, by guaranteeing him access to healthy food of a nutritional quality that meets his expectations.

Title II deals with the protection of animal health (surveillance, prevention, and control of diseases, animal health, harmonization of health protection practices, modification of the list of diseases, diseases with economic impact, OIE standards in the field of animal health, CEMAC obligations in the event of a proven crisis, transhumance of animals, markets and gatherings of animals, health mandate, veterinary and para-variant professions, professional titles admitted to the practice of veterinary medicine.

Title III relating to foodstuffs of animal and fishery origin provides for veterinary authority (coordination of control actions, designation of the veterinary authority, missions of the veterinary

authority, the legal framework of work of the veterinary authority, a sanitary inspection of meat in slaughterhouses, a sanitary inspection of fishery products in landing stages, storage and sale establishments, interventions of inspectors); control, health inspection and food hygiene measures (control, inspection, and hygiene standards for foodstuffs of animal origin (DAOA), Manuals of procedures, National structures, and cooperation mechanisms, Obligations of economic operators, etc.) are transparent and democratic. The only procedure for the adoption of a standard is through the approval of the World Assembly of Delegates, which meets every year on the occasion of the OIE General Session.

Title IV provides for mechanisms for the implementation of animal health rules at the national and Community level. These include the implementation of the HACCP method, implementation at the national level, which is the field of intervention of the veterinary services, implementation at the Community level, the Regional Committee for Food Risk Analysis, the Regional Committee for Veterinary Medicinal Products, the Regional Committee for the Identification and Traceability of Animals, the role of the animal identification structure, Network of Diagnostic Laboratories, Capacity building, communication and extension, regional alert network, Scientific Experts Network, CEMAC Livestock and Meat Interprofessional Network, Poultry Interprofessional Network, Observatories. etc.).

National texts

At the national level, the various countries have texts and regulations organizing:

The prevention of risks and disasters;

Special bodies have been set up with responsibility for risk and disaster management. This is the case in Gabon through the Directorate General for Risk Prevention (DGPR), which coordinates the national platform for risk and disaster prevention and reduction. Special mechanisms have also been set up for the management of certain risks or disasters, such as Chad's ad hoc interministerial committee for the prevention and control of avian influenza and RESCAM (Animal disease epidemiological surveillance networks) for Cameroon.

Animal health security

All countries have a comprehensive regulatory framework for animal health. These texts organize animal health policy, the management of livestock movement, and the import and export of livestock products. Certain diseases that are considered contagious, such as avian influenza, benefit from a specific regulatory environment. For the specific case of Congo Kinshasa, several texts are borrowed from the European regulatory frameworks in the event of legal loopholes. One example is Council Directive 90/539/EEC of 15 October 1990 on animal health conditions. Most of the texts in force are considered obsolete and potentially in the process of being revised.

3.1.2 Regulatory weaknesses

The following table presents the main weaknesses of the regulatory environment in the ECCAS zone.

Table 19: *Regulatory weaknesses and some solutions*

Regulatory weaknesses	Solutions
Texts and regulations in terms of disaster and risk management are not very specific to the livestock sector	Elaborate specific rules and plans for livestock crises harmonized at the regional level
The conditions and means of transport of animals are poorly regulated at the national and regional level	Elaboration of specific texts at the regional level to regulate the conditions and means of transport of animals.
The national texts are obsolete and poorly harmonized between States on specific issues (imports, exports,)	Updating and harmonization of texts with an emphasis on the border market, etc.).

3.3 *Identification of risks and disasters in the poultry value chain*

The following table presents the major risks/disasters in the poultry sector in Central Africa.

Table 20: *Recurring risk factors and disasters in each of the 5 Member States affecting PEVC*

Risk and disasters	Criticism index (G2*F)	Geographic area	Measure taken	Lesson learned
Sociopolitical instability	Severe (972)	Almost all countries	Creation of multi-national forces Population Resilience Project Few measures for the protection of the infrastructure of the PEVC	Constitution of sovereignty stocks of livestock inputs Erection of safety cords around the PEVC
The emergence of avian diseases with high epizootic potential (HPAI, Newcastle...)	Severe (1728)	All countries	Creation of ad hoc committees Strengthening of epidemio surveillance networks Setting up early warning mechanisms	Compulsory vaccination against avian diseases (Newcastle disease) Include populations in early warning mechanisms and vaccination campaigns.
The emergence of diseases with a high economic impact (COVID 19 ...)	Moderate (144)	All countries	Etat d'urgence sanitaire Fermeture des frontieres Confinement de la population (Réduction des mouvements des State of health emergency Border closure Containment of the population (Reduced movement of goods and people)	Need for the development of autonomous regional value chains for livestock inputs.

The health situation in the animal sector remains the major problem. Indeed, several actions have been carried out with the support of several technical and financial partners with mixed results. Besides, the dependence of the poultry sector on imports of strategic inputs (day-old chicks, feed, and veterinary inputs) makes it even more fragile. The response to the various crises through isolated actions further weakens the competitiveness of the sector at the national and regional levels.

Table 21: *Risky practices associated with the introduction/spread of diseases in PEVC*

Risky practices associated with the introduction of diseases in PEVC	Criticism index	Measures to mitigate the introduction of diseases	Risky practices associated with the spread of diseases in PEVC	Criticism index 2	Measures to mitigate the spread of diseases in PEVC
Porosity of boundaries	High (432)	Installation of new zoo border control posts sanitary facilities Reinforcement of health policing measures at the borders	Non-compliance with bio-security measures in the markets	Severe (1728)	Strengthening surveillance in the markets
Non-compliance with biosecurity measures (transport, breeding...)	Severe (1728)	Raising awareness among farmers	Weak control at health posts on traffic lanes	High (486)	Training of stakeholders in control techniques and rapid detection of pathologies.
Inappropriate transport (different species, non-adapted vehicles...)	High (972)	Sensitization of stakeholders on transport equipment			

3.3 *Analysis of risk and disaster management systems*

3.3.1 *Strategies and interventions to overcome*

Identification of mitigation interventions (medium-term) and strategies (long-term) to overcome risks/disasters

Table 22: *Identifications of interventions*

Identification of strategies	Identification of interventions	Responsible for implementation
Densification of the epidemic surveillance network	Installation of new zoo border control posts sanitary facilities Reinforcement of health policing measures at the borders Strengthening health policing measures at the borders	Government and actors in the poultry value chain
	Awareness-raising	
	Awareness-raising of stakeholders on transport equipment	
	Strengthening surveillance in the	
	markets	
	control techniques and rapid detection of pathologies	
	Include populations in early warning mechanisms and vaccination campaigns.	
Improvement of farm health	Raising awareness among stakeholders	
	The organization of vaccination campaigns	

3.3.2 *Identification of monitoring system*

Several monitoring systems exist in each of the countries:

Democratic Republic of Congo

- The national epidemic-surveillance service that monitors :
- Animal disease control system
- Systems of identification of animals and their origin
- Import control system
- Traceability systems
- Control of animal movements,
- Provision of epidemiological information, training, inspection, and certification

Chad

- The Food Security Information and Early Warning System (SISAAP)
- The Permanent Bureau for Livestock Crisis Prevention and Management is concerned with major food crises in livestock.
- The Food Security Information and Early Warning System (SISAAP)

- An epidemiological monitoring system with a network that covers the whole of the country and is truly involved in the management of zoo-sanitary emergencies.

Congo Brazzaville

- The National Centre for Epizootics Control which pilots the national epidemic-surveillance network for animal diseases and systems such as :
- The epidemiological information communication system
- Animal movement control system
- Traceability system
- Import control system
- Poultry identification system (non-operational)

Cameroon

- The Department of Veterinary Services in which the National Epidemic-surveillance Network is housed.
- Early Warning System for Animal Diseases
- Livestock movement control system
- Import control system
- Publishes weekly reports

Gabon

- Existence of the National Platform for Disaster Risk Reduction and Prevention
- Existence of a system for communicating epidemiological information.
- Existence of a disease control system:
- Import controls are carried out by the Gabonese Food Safety Agency whose mission is to: prevent, detect and manage health and nutritional risks present in food to place healthy, safe, wholesome, and nutritious food on the market.
- Inspection and Certification:
- Inspection and certification are also carried out by the Gabonese Food Security Agency.

Table 23: *Identification of existing monitoring system*

Country	Existing monitoring system	Creation date	Priority diseases	Diseases reported most often	Agent category	Function by agent category	Number of agents per category
Cameroon	epidemic-surveillance network	09 September 2014	06 priority diseases including 02 avian diseases		Veterinary Doctor Veterinary technicians (para vets)		
Congo Brazzaville	National Centre for the Control of Epizootic Diseases) (structure created at the end of the	2010 Order n°9191 of 22nd November 2010	8 priority diseases monitored, including 2 avian diseases (Disease Newcastle and Avian Influenza)	Newcastle disease, coccidiosis, avian pox	Doctor Veterinarian Veterinary technicians (para vets)	Director CNCE Head of Department Epidemiology, Head of Department Communication, Head of Department Wildlife Epidemiology Agent of the National Epidemio-surveillance Network for Animal Diseases	
Chad	REPIMAT	1995	thirteen animal diseases considered important		fonctionnaires, vétérinaires et des para-vétérinaires.		500
Gabon	National Platform for Disaster Risk Reduction and Prevention	16 may 2011					
DRC	Direction d'epidemio -surveillance	November 2018		gumboro and Newcastle	Viral disease	Director	30

3.3.3 *Laboratory*

Tableau 24: *laboratory capacity*

Country	existing laboratory	Location of laboratories	Types of analysis	Priority poultry diseases	sample analysis capacity/day	Human resource category	Number by category	function in laboratories
DRC	3	Kinshasa Lubumbashi Goma	Bacterio- virology Parasitology Molecular	Newcastle Gumboro Infectious bronchitis Ilt Pox Mareck	One sample per department	Doctor Lab Officer Surface technician	Tens	
Chad	01	The Institute for Livestock Research for Develop-ment (IRED)						
Cameroon	03	Lanavet ga-roua, douala, bafoussam	Microscopy, serology, ELISA	Newcastle disease; Infectious bronchitis; Fowl typhoid; Fowl cholera; Gumboro disease; Fowlpox		78	13 senior staff 19 junior staff 46 laborers	
Gabon	01	Interdisciplin-ary Medical Research Centre of Franceville	Elisa, PCR, mushroom culture					
Congo	Diagnostic Laboratory Veterinary surgeon of Brazzaville (LDVB)	Brazzaville	AGID ELISA IFI	Disease of Newcastle, Highly pathogenic avian influenza or bird flu	10 samples per day	Veterinary doctor Technician veterinary	4 6	Head of Bacteriology Department Head of Serology Department, Head of Department Parasitology

3.3.4 *Contingency analysis*

Table 25: *Description of national/regional contingency plan*

Country	National contingency plan	Priority emergencies of the national contingency plan
Cameroon	National Contingency Plan	Animal pests
Gabon	Disaster risk reduction (DRR)	
Congo Brazzaville		Newcastle disease Highly pathogenic avian influenza or avian flu

Financial and resilience measures

There is no functional compensation mechanism in most countries. The insurance system is non-existent for these countries. Some countries such as Chad and Cameroon have within cooperation projects (IDA fund of the World Bank) lines of credit in case of major health crises. These lines are only available for the duration of the financing and are of very little lasting nature. Nevertheless, Gabon has a fund for crisis and disaster management. Compensation measures and activation mechanisms are governed by texts that are currently being revised. They aim in particular to:

- Strengthening the management of the Risk Contingency Fund;
- The promotion of an investment policy through financing by the private sector, organizations, and others;
- The optimization of public investment in disaster risk reduction and private sector financing of disaster risks. On the other hand, there is no specific fund for disaster management related to the livestock sector, in this case, the poultry sector. Similarly, there is no insurance mechanism for poultry farming. Unless you subscribe to an insurance company. This process remains very expensive.

SWOT analysis of contingency plan

Tableau 26: *SWOT analysis for the contingency plan*

Strengths	Weaknesses
Existence of contingency plans for Newcastle disease and highly pathogenic avian influenza or bird flu. Existence of disaster contingency plans at the regional and national level	Lack of special funds to deal with a possible health crisis Lack of preparation of human resources (simulation exercise) in the event of a health crisis.
Opportunities	**Threats**
Advocacy for the establishment of a special fund for disaster reduction at the regional and national level	COVID 19 Systematic prioritization of resilience actions over prevention actions

Interventions and strategies by live2Africa link with risk/disaster management

Strategic actions	Activities	Period		
		ST	MT	LT
Strengthening capacity for surveillance, early detection, and response to health crises (SOP, EOC)	Training of agents of the network (seminar- workshops)			
	Acquisition of equipment for sampling, conservation, and transport of samples Acquisition of the cold chain			
	Acquisition of rolling stock (motorbikes)			
	Training of laboratory staff in modern diagnostic techniques			
	Elaboration of SOPs for animal (avian) health crises			
Reinforcement of laboratory diagnostic capacities	To intensify the plea for the creation of a special crisis fund for animal health (regional and national).			

4. Analysis of programs/ initiatives for the development of the poultry sector (2000-2020)

4.1 *Identification of initiatives for the PEVC*

The table presents the list of programs/initiatives in Central Africa for the poultry sector.

Table 27: *List of some programs involved in poultry production by country in the sub-region:*

Pays	Number of programs/projects	Some projects/programs
Cameroon	13	PRODEL, PNVRA, PADAV, PACA, ACEFA, etc.
Congo Brazzaville	05	PACE – Congo, SPINAP Congo VACNADA Congo) PRODER SUD
Chad	02	-PNSA, -avian flu project
Gabon	02	PRODIAG PADAP

4.2 *Policy and regulations frameworks supported by the programs*

The table presents some policy and regulation frameworks supported by the program in Central Africa country.

Table 28: *Policy and regulation frameworks supported by the program/initiative.*

	Policy and regulations frameworks	Objectives
Cameroon	Joint Order n°0006/MINEPIA/MINSANTE of 15 March 2006	Adds the Avian Influenza to the nomenclature of livestock diseases deemed legally contagious with a compulsory declaration;
	Order n°0007/MINEPIA of 16 March 2006	Declared infection with Highly Pathogenic Avian Influenza (Avian Influenza) in the Far North Province;
	- Decision n°0028/MINEPIA of 17 March 2006, modified by Decision n° 00164/MINEPIA of 25 July 2006	Suspending the importation of certain animal species susceptible to Highly Pathogenic Avian Influenza (Avian Influenza) and certain types of breeding material
Congo Brazzaville	Law N°17/67 of 30 November 1967 determining the penalties applicable to offenses committed in violation of the provisions of Decree N° 67 /182 of 17 July 1997 regulating the animal health police and	Animal disease control
Republic of Congo	Decree N°67/182 of 17 July 1967 regulating the animal health policy in Order N°4645/BE47-14 of 16	Republic of Congo Health protection of the national herd
	December 1968 regulating the movement of livestock throughout the territory of the Republic of Congo	Sanitary protection of national livestock

4.3 *Main objectives of the projects/programs*

On the socio-economic level

Family farms are mainly targeted. The aim is to increase their productivity and significantly increase overall production to reduce the balance of trade, combat food insecurity, and contribute to consolidating peace through the creation of jobs, particularly for young people and women. In most cases, vulnerable groups are taken to task. Modern animal husbandry techniques are popularised among these groups. Similarly, targeted support in the area of vocational training is provided to young people starting in the livestock sector. The long-term objective is to professionalize the actors and boost the creation of modern units to turn commercial production around.

In terms of health

The main objective of the projects is to strengthen early warning and control mechanisms for animal diseases. Thus, the objective is to strengthen veterinary services for the sanitary protection of herds. Vaccination campaigns are carried out to strengthen the animal disease surveillance system.

On the environmental front

Specific support is directed towards the development of ecological livestock farming. Actions for the production of renewable energy from livestock waste have been identified. Actions

oriented towards the development of local poultry production adapted to the environment. A regional gene bank has been created at the University of Dschang for the characterization and conservation of animal breeds/stocks. Projects have an average duration of five (05) years.

Key Stakeholders

The main stakeholders are:

- Government institutions (ministry, government agency...)
- Technical and financial partners (IFAD, World Bank, FAO, AU-IBAR...)
- Farmers' and inter-professional organizations
- Actors in the livestock and poultry sectors in particular

Geographic area

Several projects have a local development scope, generally in the production basins on the outskirts of large cities. Some projects have a national focus as they address the development of the global supply chain and the marketing of products.

Gap

In countries such as Cameroon, the various programs have contributed to the remarkable competitiveness of the local sector. In Chad, the subsidies granted have enabled actors to settle permanently in poultry farming and the production of eggs for consumption has increased by more than 10% in the capital. Despite these significant results, progress in terms of the sustainability of investments by small producers is still pending. This is due to the persistence of imported products and the health situation, which persists with the high incidence of animal diseases that are a burden on the investments made.

4.4 Potential actions for the live2Africa project link with initiatives program

Table 29: *Potential actions for the live2Africa project link with initiatives program*

Actions	Activities	Period		
		ST	MT	LT
Support for the improvement of the viability, sustainability, and resilience of projects and programs related to the ECDP	The organization of seminar-workshops on technical management economic of the projects and programs			
	The organization of specialized technical training courses on the management of projects and programs			
Valorization of local breeds of hens	Set up a program of characterization, selection, and study of the zootechnical performance of these local breeds.			
	Supporting research work by providing funding to researchers working on this theme			

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Annex

Evaluation of criticism index

The criticism index is used to categorize a risk or a disaster:
CI=G2xF

Table 30: *Frequency of risk/disaster occurrence*

Criteria	Interpretation	Cotation
Weak	Risk/disaster is possible when the attack occurs once or twice every 10 years.	1
Moderate	Occurrence of risk/disaster is possible	3
High	When the attack occurs 3 to 4 times every 10 years	6
Critical	The risk/disaster is possible when the attack occurs 5 to 6 times every 10 years.	9
Disastrous	The risk/disaster can occur when the attack occurs 7 or more times every 10 years.	12

The table below presents the severity of the risk based on the number of area affected according to the territorial divisions (Province/Region)

Table 31: *Criteria to analyze severity of the risk/disaster*

Criteria	Consequences	Cotation
Minor	Low as it affects only part of one country are affected	1
Significant	Moderatly considerable as 01 country are affected	3
Major	Considerable as 02 countries are affected	6
Critical	Serious because as 03 countries are affected	9
Disastrous	Uncontrollable as 04 countries are affected	12

CI : criticism index G : gravity or severity F: frequency

Criticism index evaluation ($IC = G^2 \times F$) : where, G is the serverity, F is the frequence of occurrence.

Table 32: *Evaluation of criticism index*

	F1	F3	F6	F9	F12
G12	IC=144	IC=432	IC=864	IC=1296	IC=1728
G9	IC=81	IC=243	IC=486	IC=729	IC=972
G6	IC=36	IC=108	IC=216	IC=324	IC=432
G3	IC=9	IC=27	IC=54	IC=81	IC=108
G1	IC=1	IC=3	IC=6	IC=9	IC=12

Source: *Mouffok et al., 2013*

Table 33: *interpretation of criticism index*

IC = 1 IC = 3 IC = 6 IC = 9 IC = 12	Negligible (then the risk/ disaster has very low or inconsiderable impact)	IC = 27 IC = 36 IC = 54 IC=81	Weak (then the risk/ disaster has low impact)
IC = 108 IC = 144 IC = 216 IC = 243	Moderate (the risk/ disaster has moderate impact)	IC = 324 IC = 432 IC = 486 IC = 729	High (the risk/disaster has high impact)
IC = 864 IC = 972 IC = 1296 IC = 1728		Severe (the risk/disaster has very high impact)	

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