

PRODUCTION AND ANIMAL INDUSTRY

Diagnostic report



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INTRODUCTION

This diagnostic report on livestock, fisheries and fish farming sub-sector in the West Region is part of the preparation process of the Regional Spatial Planning and Development Plan (SRADT). The elaboration of this inventory is part of the government's desire to make livestock, fisheries and fish farming occupy a key position in the fight against poverty, ensure economic growth and achieve sustainable development goals; although the importance of the role of livestock savings or social exchanges by rural sponsors is difficult to measure and often left out in national statistics. The potential of this sector is huge in the region and must be exploited to help reduce the country's chronic animal protein deficit. Therefore, through an approved procedure to reunite policies and sponsors of fishing and fish farming sector at local levels; and this must take place in a framework aimed at the well-being of the population.

The prime objective of this study is to be a reference framework for better orientation and monitoring of livestock activities in the region by ensuring that they meet the requirements of emergence by 2035.

In order to make the sector efficient and ensure the achievement of these desired goals, the Ministry of Livestock, Fisheries and Animal Industries adopted a sub-sectoral strategy developed in 2011, which emanated from the Growth and Employment Strategy Paper (GESP). The implementation of this strategy has required and still requires a better knowledge of the resources and potential of each participant at each stage of development in order to efficiently plan the required investments.

1. Some statistics and observations of the sector in the region

The data obtained from the MINEPIA statistics department in 2015 proves that controlled livestock in the West region is comprised of:

- 89147 cattle
- 39448 sheep
- 94838 goat
- 217761 pigs, with nearly 80% of hybrids originating from various crosses between local and imported breeds
- 8703460 poultry, with 2796081 layers, 4404720 broilers, 1466491 traditional chickens and 36167 other species.
- According to EPIA stat 2015, the controlled meat production was of 10084 tonnes, that is 1094 tonnes of beef, 55 tonnes of sheep meat, 78 tonnes of goat meat, 767 and 8091 tonnes of pork meat
- Also, the region produced 48111.9 tonnes of table eggs, 2084.8 tonnes of milk, 8 tonnes of honey, 3591 cattle skin and 343 small ruminant skin.
- 1803 tonnes of fish production (fishing).

Despite its importance in the region's economy, livestock, fisheries and fish farming remain undervalued and the efforts made by producers to manage the sector does not meet up with expectations. Although the region's overall animal protein production has been constantly increasing in the past years, its performance remains below its potential. However, the livestock, fisheries and animal industries sub-sector in the region has a strong potential for agro-ecological resources which when exploited can contribute to strengthening national production of products of animal origin.

Ruminant breeding, especially cattle breeding due to population density, is essentially extensive and is carried out on mountain tops or in the uninhabited areas of the Noun division. It is characterized by the

movement of animals over more or less long distances. Concerning the pig sector according to EPIA stat 2015, the region is one of the three main pig production regions in Cameroon despite the constant increase in African Swine Fever (ASF) outbreaks. As for bee-keeping and non-conventional breeding, they are still essentially traditional.

The processing industry for livestock, fishing and fish farming products, is very rare in the region. There are some infrastructures providing primary processing products such as slaughterhouses or traditional smoking rooms, mainly for fish.

Fish farming and animal industries sector has significant assets and potentials in the region. These include:

- The huge agro-ecological diversity.
- High pasture lands, free from certain conflicts.
- A significant hydraulic potential.

However, there are some factors that can hinder the development of the sector. These are:

- Low productivity of animal resources;
- Low productivity of fodder resources;
- Lack of adequate infrastructure and equipment
- Redundancy of epizootic diseases.
- The lack of mastery of suitable production and processing techniques;
- Poor organisation of marketing and market channels.
- Presence of foreign fishermen on water bodies
- Lack of professionalism among fish farming participants.
- Lack of quality seeds, resulting from the lack of organization of the sector.
- Lack of a local industry manufacturing fish feed

The challenges faced by the livestock, fisheries and animal industries in the region are those of efficient spatial planning in order to ensure local food security, sustainable employment creation and improved income for local operators. Also, several land conflicts in the region are encountered by the numerous land users, between individuals and the state, or between villages.

Sustainable development of the region requires better management of the natural environment's resources and more appropriate grazing land management methods so as to increase productivity per unit area. This requires better management of livestock, the eradication of health problems and the improvement of the business environment.

2. THE ROLE OF LIVESTOCK, FISHING AND FISH FARMING IN THE REGIONAL ECONOMY

The primary sector is a source of employment in Cameroon (60% of the active population) and in the region. Concerning the livestock sector at the national level, 70% find a means of diversifying their source of income and savings while 35 per cent of this rural population lives exclusively from livestock.

The Annual Pastoral Survey (EPA, 2012) shows that pastoral households constitute 21.6% of the total households. This means that on average one out of five households carries out at least one type of livestock farming. In the West Region this proportion constitutes 27.3%.

Livestock plays an important role and therefore contributes significantly to improving rural production, especially in densely populated areas in the West. Pastoral households in the West mainly rear chickens, pigs, goats and sheep. These activities are carried out by 88%; 35.4%; 30.0% and 10.4% respectively by pastoral households. The importance of free range fowl rearing is due to the fact that it does not require huge investment. Income obtained from livestock by pastoral households in Cameroon is 28% (EPA, 2012). In the West region, the percentage of these income (23%) is relatively lower than that of the national average. This data is obtained from animal statistics in the region and therefore market values are not very high, especially for free range fowls.

Fishing and aquaculture, as well as livestock farming, are of nutritional, social and economic importance in the region in terms of nutrition and food security, employment, income and livelihoods for thousands of people. The sector also contributes to the region's economy through taxes, trade and foreign exchange exports. Local fishing activity provides direct and indirect employment. These indirect activities include processing, preservation, storage, distribution and marketing. The role of women in the fishing industry in the West is important, especially in the trade, processing and marketing of fishery products.

3. ORGANISATION OF THE LIVESTOCK FISHING AND FISH FARMING SECTOR IN THE WEST

3.1. Global context

Livestock, fishing and fish farming is a major sub-sector of the rural world in general and in the West in particular. Formerly a familiar activity for breeders who respect traditions, breeding, fishing and fish farming now has a new generation of operators in this sector of the country, seeking significant income to satisfy their well-being.

In the Growth and Employment Strategy Paper (DSCE), the Government of Cameroon has developed a global vision of the economy aiming at the country's emergence by 2035. This document contains a summary of the country's future economic activities and is structured around five major themes whose application at the regional level is:

- The development of production infrastructures due to local potentials;
- The improvement of production equipment following the observations made in the locality;
- Adequate development of human resources;
- Regional integration and trade diversification to ensure full complementarity;
- The financing of livestock farming.

3.2. Regional institutional context

Decree No. 2012/382 of 14 September 2012 on the organization of the Ministry of Livestock, fisheries and Animal Industries provides four Directorates for production activities. These are:

- Directorate for the Management of Outputs and the Animal Industry
- Directorate of Pastures, Animal Feeding and Livestock Infrastructures,
- Directorate of Veterinary Services,
- Directorate of fishing , Aquaculture and fish Production

The Ministry's organizational chart also includes the Directorate of General Affairs and the Department of Research, Planning, Cooperation and Statistics.

At the decentralized level, MINEPIA has 10 regional delegations, each with four technical departments:

- Regional Service for the Management of Outputs and Animal Industries;
- Regional Service of Pasturing and Pastoral Hydraulics
- Regional Service for Health Protection and Veterinary Public Health;
- Regional fishing and Aquaculture Service.

The operational division of the management structures of the Livestock, fisheries and Animal Industries sector in the West Region are presented in the table below

Their mission is defined in Article 12 of Decree No. 2012/382 of 14 September 2012 by the President of the Republic, on the organisation of MINEPIA.

Table 1: Operational distribution of the DR/EPIA in the region

Divisional Delegation	Sub-Divisional Delegation	Zoo-technical and Veterinary centre	CP/PCP/Aquatic centre
DDEPIA Bamboutos	DAEPIA of Mbouda	CZV Mbouda	
	DAEPIA of Galim	CZV Galim	
		CZV Bamenyam	
		CZV Bamendjing	PCP of Bamendjing
		CZV Bangam	
	DAEPIA of Babadjou	CZV Babadjou	
	DAEPIA of Batcham	CZV Batcham	
		CZV Bagang	
		CZV Balatchi	
DDEPIA Hauts Plateaux	DAEPIA of Baham	CZV Baham	
		CZV Gougoua	
	DAEPIA of Bamendjou	CZV Bamendjou	
		CZV Bameka	
	DAEPIA of Bangou	CZV Bangou	
		CZV Bandenkop	
DDEPIA Haut Nkam	DAEPIA of Batié	CZV Batié	
	DAEPIA of Bafang	CZV Bafang	
	DAEPIA of Banka		
	DAEPIA of Bana	CZV Bana	
		CZV Batcha	
	DAEPIA of Bakou	CZV Bakou	
	DAEPIA of Bandja	CZV Bandja	PCP of Bandja
	DAEPIA of Kekem	CZV Kekem	PCP of Kekem
DDEPIA Kountou	DAEPIA of Banwa		
	DAEPIA of Poumagne	CZV Bandjoun	
	DAEPIA of Bayangam	CZV Banyangam	
		CZV Bandrefam	
DDEPIA Menoua	DAEPIA of Djebem		
	DAEPIA of Dschang	CZV Dschang	
	DAEPIA of Kong-ni	CZV Baleveng	
		CZV Bafou	
	DAEPIA of Penka Michel	CZV Penka Michel	

Divisional Delegation	Sub-Divisional Delegation	Zoo-technical and Veterinary centre	CP/PCP/Aquatic centre
		CZV Bamendou	
	DAEPIA of FongoTongo	CZV FongoTongo	
	DAEPIA of Santchou	CZV Santchou	
		CZV Fondonera	
	DAEPIA of Fokoué	CZV Fokoué	
DDEPIA of Mifi	DAEPIA of Bafoussam 1 ^{er}	CZV Bafoussam	PCP of Bafoussam
		CZV Banefo	
	DAEPIA of Bafoussam 2 ^{ème}	CZV Baleng	
	DAEPIA of Bafoussam 3 ^{ème}	CZV Bamougoum	
DDEPIA Ndé	DAEPIA of Bangangté	CZV Bangangté	
		CZV Kamna	
		CZV Bamena	
		CZV Ndet	
	DAEPIA of Bazou	CZV Bazou	
		CZV Balengou	
	DAEPIA of Tonga	CZV Tonga	PCP of Babitchoua
DDEPIA Noun	DAEPIA of Bassamba		
	DAEPIA of Fouban	CZV Fouban	
	DAEPIA of Njimon	CZV Njimon	
	DAEPIA of Koutaba	CZV Koutaba	
		CZV KoupaKagnam	
	DAEPIA of Foubot	CZV Foubot	
		CZV Momo	
	DAEPIA of Kouuoptamo	CZV Kouoptamo	
		CZV Bankouop	
		CZV Njitapon	
		CZV Njigoubé	
	DAEPIA of Malentouen	CZV Malentouen	
		CZV Maguiembou	
	DAEPIA of Massangam	CZV Massangam	
		CZV Yolo	
		CZV Maladen	
	DAEPIA of Magba	CZV Magba	CP Matta Barrage
	DAEPIA of Bangourain	CZV Bangourain	DAEPIA of Bangourain
		CZV Bangambi	
08 DDEPIA	40 DAEPIA	64 CZV	01 CP, 06 PCP

We also have the existence of certain specialized organizations and institutions in the West region namely the Kounden Zoo-technical Station, and the National Centre for Zoo-technical, Veterinary and fisheries Training (CNFZVH). This centre is in charge of the training, enhancement, upgrading and specialisation of staff responsible for supervising producers in the field of livestock and animal health.

3.3. Legal and land context

The livestock sector is governed by approximately 174 texts (Douffissa, 2013). Among these texts, thirteen regulate animal production activities, three on animal industries, twenty-nine on fishing and aquaculture, eight on the common regulatory framework of production and industries, fishing, manufacturing and use of veterinary pharmaceutical products and twenty-nine on veterinary health and zoonotic diseases. These texts are also applied in the region.

On land aspects, in addition to customary law, the main law in the region on existing legislation is found in

- Decree No. 78/263 of 3 September 1978, establishing the modalities for settling agro-pastoral disputes;
- Decree of 9 August 1989 amending and supplementing Decree No. 02/MINEPIA of 20 July 1988 updating the Trail of Livestock Tracks.

However, Cameroon's land tenure system, through its 1974 ordinances, gives the State all unregistered land (national domain). However, the prevalence of customary practices is present in rural areas and land regulation is not in the area of competence of modern law. Moreover, the national domain is not mapped and the overlapping roles of the various stakeholders do not promote conservative management of the domain. The absence of rights of cattle breeders in some areas of the region where traditional chiefs still possess all the land, makes long-term actions, which are essential for sustainable development, difficult to achieve.

4. TYPES OF ANIMALS REARED IN THE WEST

The distribution of livestock and fish farming areas in the West is influenced by factors such as land, vegetation and the human environment. Agro-pastoral households are mostly engaged in the rural sector in the West.

The huge importance of the various livestock's reared in the region (table below) shows that it is small but has development potential that can be an asset not only for the West but for the whole country. Also, the importance of this sub-sector is often underestimated because of calculation methods that do not include certain products such as manure and therefore the benefit goes to other sectors, especially in a densely populated area such as the West Region.

Table 2: Registered amount of the main species reared in the West Region and % in comparison with the national average

Assumptions	Cattle	Sheep	Goat	Pigs	Poultry	Grass-cutter	Guinea pig
West	89,147	39,448	94,838	217,761	8.703,460	148	36058
National	7,162 503	3,196 791	6,264 763	3,648 433	87.813829	19782	143283
%	1.24	1.23	1.51	6	9.9		

Source: EPIA Stat, 2015

In terms of fish farming, the production of fish captured was 1803 tonnes against a national total of 266769.3 tonnes.

4.1. Main observations in the West

4.1.1. Cattle breeding

4.1.1.1. Breeding method

In Cameroon, cattle breeding is dominated by the zebus (*Bos indicus*). In the West, the dominant species are the Peulh Zebus, which represent only 1.24% of the national livestock in this area and are reared in areas that are often small.

Cattle breeding in the West is essentially traditional and carried out by Peulh or Mbororo breeders. In the local system, livestock graze around concessions and on hillsides, then are taken on transhumance to the grassy plains in the dry season. This type of livestock farming is increasingly causing agro-pastoral conflicts due to growing of off-season crops towards the hills or towards the plains, which were once considered as transhumance areas. In addition, it makes it difficult to monitor and control the health of herds on the one hand, and to supervise and inform stakeholders on the other. In the West, transhumance is mainly carried out in the plains of Santchou, Noun and Koung-khi. Semi-intensive breeding with semi-stabilization or hindered stabilization is also encountered.

4.1.1.2. Operators

Cattle breeding is mainly carried out by the Peuhl or Mbororo but also by a growing minority of the populations found in the Noun, Ndé, Bamboutos and Menoua divisions.

Globally, there are three levels of intervention in the sector: production, which includes livestock farmers, marketing, which includes agents, intermediaries, resellers and wholesale sellers, followed by small-scale processing, with butchers, restaurants, roadside meat sellers and households as the main participants. Other than these participants, we can also find leather sellers

Some breeders are grouped into OPs and associations. There is a Fédération régionale des éleveurs du bétail de l'Ouest (FEREBO) is found in Bafoussam which includes: 1093 OPs and cattle farms, 52 dairy cow OPs and 23 dairy product OPs.

4.1.1.3. Cattle livestock

The region's cattle size is poorly known due to multiple movements of livestock during the year from the North-West or Adamawa regions to the West region and sometimes vice versa. We are often satisfied by statistics from vaccination campaigns, while considering that farmers do not always present all their animals for vaccination. Also in an approximate manner, the distribution of monitored livestock according to division between 2016 and 2017 is presented in the table below

Table 3: Monitored cattle herd in the region between 2016 and 2017

Divisions	Category							
	Young Bull	Calf	Neutered	Bull	Cow	Calf	2017 TOTAL	2016 TOTAL
Bamboutos	1205	1421	110	646	2301	442	6125	5,607
Hauts Nkam	118	205	162	48	380	155	1068	1068
Hauts-Plateaux	204	263	76	43	383	99	1068	914

Divisions	Category							
	Young Bull	Calf	Neutered	Bull	Cow	Calf	2017 TOTAL	2016 TOTAL
Koung-Khi	85	210	13	107	736	242	1393	1370
Menoua	856	876	181	586	1578	856	4933	4909
Mifi	0	0	0	5	10	5	20	48
Ndé	411	792	145	1,664	3,893	1,313	8,218	7604
Noun	16,402	17,228	2,807	7,129	35,982	13,111	92658	104,411
2017 TOTAL	19281	20995	3494	10228	45263	16223	115483	
2016 TOTAL	18,773	20,551	4379	14243	50,396	17,589		125,931

The most common breeds are:

- Zebu Akou or White foulani,
- Zébu Djafoun or Red foulani and
- Zebu Akou without horns or Akou goudali.

In the Noun, we also observe the progressive introduction of dairy breeds, namely Holstein, into dairy production units. Noun division was the largest cattle production area in the West region with nearly 83% of livestock in 2017. It is followed by the Ndé, Bamboutos and Menoua.

4.1.1.4. Milk production and by-products.

Milk production strictly remains a traditional activity. Production techniques are home-made in traditional and semi-intensive livestock farming. Milk production remains low, as the primary purpose of cattle farming in the region is meat production. The production volume of fresh milk in 2017 was less than one million litres (705,931 litres).

Some dairies exist in the localities of Bayangam (Koung Khi), Foubot and Tayandi (Noun), the Benedictan Sisters of Babeté (Bamboutos) and Baleng (Mifi). The end products are curdled milk, butter and yoghurt. Fresh milk and its by-products are sold at livestock and local markets in the region.

4.1.1.5. Importance of other by-products of the beef sector

By-products of cattle farming that have direct or indirect economic value include the hides and skins of slaughtered animals. The latter are often used locally but also transported to other regions, especially in the North-West. Cow dung is used to fertilize the soil, blood and bones from slaughterhouses are used in animal feed (especially poultry), while ox horns are used in crafts.

4.1.1.6. Livestock slaughter infrastructure

An average of 472 controlled slaughtering's are carried out in the West Region per week. There are a total of 55 municipal slaughter structures in the region. The infrastructure necessary for beef production in the region is very inadequate and can be a major constraint to the development of this sector.

Table 4: Type and distribution of slaughter structures in the region

Infrastructures	Bamboutos	Haut Nkam	Hauts-Plateaux	Koung Nki	Menoua	Mifi	Ndé	Noun	Total
Butchering centre	5	0	3	0	3	0	0	7	18
Killings	4	3	1	0	5	0	2	16	31
Slaughterhouses	0	0	1	1	1	1	0	2	6
Total	9	3	5	1	9	1	2	25	55

4.1.1.7. Problems of agro-pastoral conflicts in the region

Agriculture and extensive or semi-extensive livestock farming (cattle and small ruminants) now coexist in the mountainous areas of the region. These areas, formerly reserved for grazing Mbororo livestock, are gradually being colonized by the food crop market. This progressive colonization of pastoral areas can be traced as far back as several decades and, depending on the area, it has been carried out in an authorized or anarchic manner. The overall result is a repetition of agro pastoral conflicts in areas of high livestock concentration or seasonal transhumance. This is the case, for example, of the Kouoptamo District in the locality of Kounden where Mbororo herders are regularly threatened by farmers.

During the European colonization, the Mbororo of North Cameroon and Eastern Nigeria, driven out by the excessive taxation of their suzerains, migrated to the East and South to settle on the extensions of the Adamawa. They arrived on the heights of West Cameroon in the 1930s and discovered open meadows on the slopes of Bamboutos, representing a breeding region with exceptional qualities. As soon as they settled down, they are accepted by the Bamileke who considered beef meat, a good substitute at a time when hunting became unproductive. Also, their extensive land use system does not show prove of any risk of appropriation on the land reserves they travel with their animals on. On these grassy savannahs, above 2000 m above sea level, they set up wintering camps from which they organise movement towards dry season pastures. With demographic pressure and the scarcity of land on the plateau, they encountered rejection from the Bamilékés as early as the 1950s. From now on, their relations with livestock breeders became conflictual.

Jean-Marie FOTSING¹

Mountainous areas of the Noun, Bamboutos, Ndé and Haut-Nkam divisions are home to large transhumant cattle herds.

4.1.1.8. Routes, transits and equipment for transhumance and livestock movements in the region

Figure 1 shows areas of high livestock activity, as well as the distribution of grazing lands, routes and main transhumance equipment in the region.

The marketing circuit consists mainly of short circuits designed to meet the needs of growing urban populations. The long routes consist of a connection between the West and the major consumption basins. Transport is mainly by foot.

¹ Les Cahiers de la Recherche Développement n°20 –Décembre 1988 : Problèmes fonciers et élevage bovin Bamiléké : Exemple du Nord de Bafou (Ouest Cameroun)

Photo 1: Infrastructures



Forage à énergie solaire à Tonga



Élevage en semi stabulation



Tuerie de Ntonga

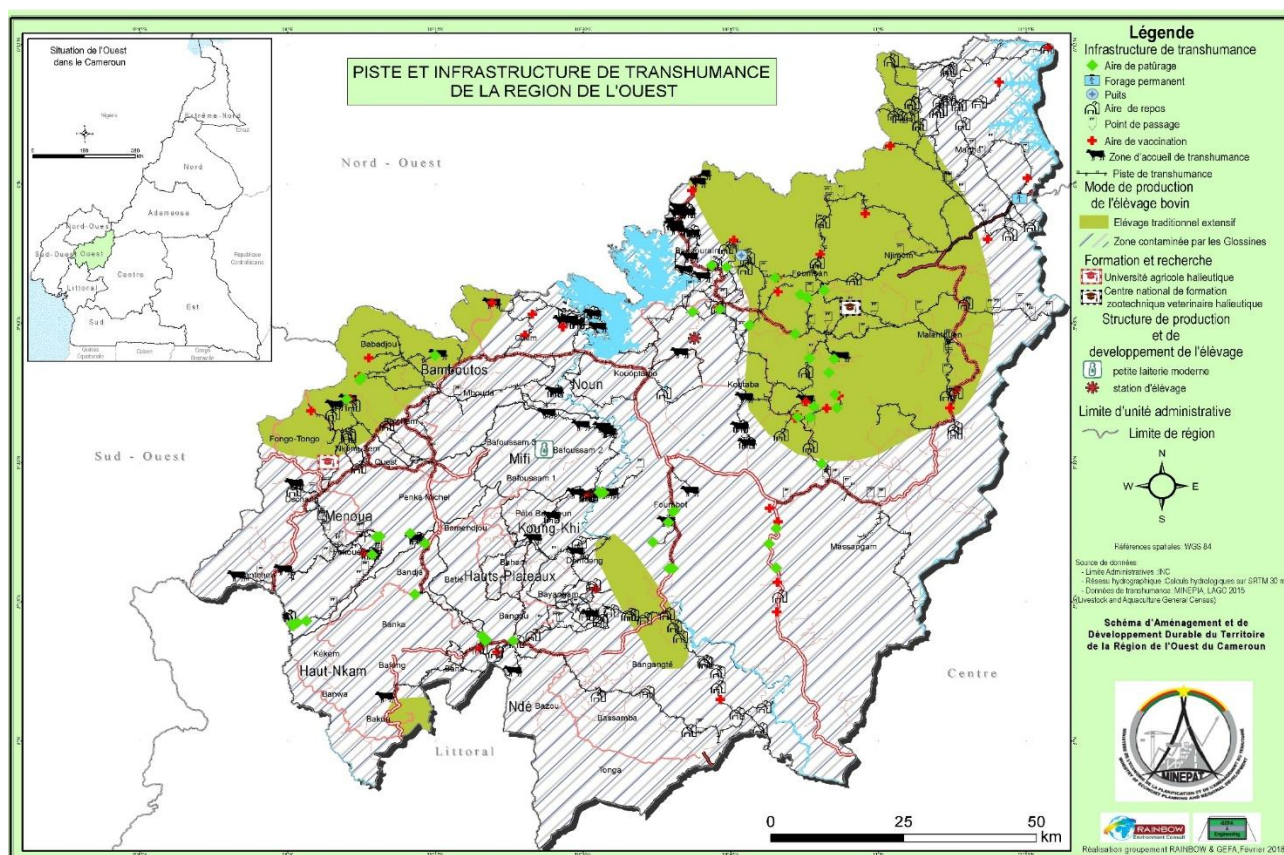
Transit, relocation and transhumance are the main reasons for livestock movements in the region. Slaughter shops located in another locality or out of the region are for the most part the ultimate destination for animals in transit. Animals leaving the region are meant for slaughter in major centres of the Littoral or South-West. Some exporters of cattle and small ruminants towards CEMAC countries come to the Noun markets for supplies.

Transhumance equipment includes: boreholes, wells, rest areas, crossing points, vaccination areas, transhumance reception areas, transhumance trails, dairies, etc.

4.1.1.9. Main constraints

Cattle breeding in the region and especially traditional or extensive livestock farming are greatly affected by the effects of climate change, the drying up of rivers (due to agricultural intensification) and the restriction of rangelands. The feeding of livestock has therefore become a major concern in the Region. There is also a progressive wearing out of agro-sylvo-pastoral resources due to high population density and production systems that are not always appropriate and do not sufficiently exploit the collaboration that should exist between different methods of land use, namely agriculture and livestock.

Figure 1: Tracks and transhumance infrastructure in the West Region



4.1.2. Pig farming

Pig farming is carried out by the non-Muslim population in the region. According to EPA stat 2015, the West has 6% of the country's monitored livestock. But actually these statistics are far below the real state because in rural areas the majority of farmers keep at least one sow in full reproduction. However, the sector regularly faces African Swine Fever epizootics, a viral disease for which there is no treatment or vaccine.

4.1.2.1. Breeding method.

There are several pig farming systems in the region and throughout the country. According to the 1995 MINEPIA study in the livestock sector, three types of livestock farming are carried out in the region, namely:

- Traditional livestock farming
- Semi-intensive breeding
- Intensive breeding.

All these types of livestock can be found in all areas, whether rural, semi-urban or urban. The various manure and by-products of pig farming are highly sought after for agriculture in the region.

4.1.2.2. Livestock

The pigs found in West Cameroon can be grouped into three categories:

- Exotic species
- The local species and

- Hybrids

More than 80% of the pig population in the West Region is made up of hybrids resulting from various crossbreeds between local and improved breeds (Large white, Land race, Duroc, Piétrain and Naima). These improved breeds are characterised by good reproductive performance and rapid growth. The contribution of Kounden sausage piglets (Naïma breed) on improving production and productivity has boosted initiatives on improving the region's pig genetic heritage. It should be noted that the typical local breed called "bamiléké pig", which is very hardy and resistant to traditional breeding conditions, has almost disappeared.

Table 5: Progress of the pig size by division between 2015 and 2017

Divisions	Years		
	2015	2016	2017
Bamboutos	25,282	17,843	19,737
Haut Nkam	12,548	14,883	14,883
Hauts-Plateaux	26,897	44,687	22,414
Koung-Khi	11,535	11,787	14,450
Menoua	14,627	20,561	26,171
Mifi	8,226	2,991	2,106
Ndé	6,575	7,402	6,801
Noun	10,690	26,478	8,445
		15,000	
TOTAL	116,380	161,632	115,007

Source: DR/EPIA West, 2017

Pig farming is carried out in all the divisions of the region. However, the most important livestock are found in Menoua, the Haut-Plateaux and Bamboutos.

4.1.2.3. Operators

Pig farming in the West involves many operators, including breeders, reelers, traders, “people who roast meat” and consumers. Breeders can be classified into three groups, namely

- piglet producers or multipliers who produce only piglets intended for fattening farms;
- fatteners specialising in the production of pigs for slaughter and,
- calf fatteners who do both multiplication and fattening.

Several reelers in the region, buy pigs from the farmers on behalf of the traders. While at the level of traders, there are merchants who buy pork from them and sell it either to butchers, to “people who roast meat” or to consumers.

Most pork producers in the region are grouped into producer organizations (OPs). In 2017, a total of 856 CIGs involved in the pork industry were identified in the West Region. These CIGs are divided into 57 CIG unions, 09 CIG federations and 02 CIG confederations. These CIGs are mostly established in the main pig production basins in the region, namely in the Noun (250 CIGs), Bamboutos (153 CIGs), Hauts-Plateaux (113 CIGs) and Mifi (112 CIGs) divisions.

4.1.2.4. Infrastructure and equipment

Production farmhouses in the region are generally built either:

- With temporary materials (boards, bamboo) for family breeding,
- With long term materials (blocks, mud bricks) for semi-modern or modern breeding.

Farmhouses made of local materials can be built either on stilts or on the ground, covered with mats or sheets depending on the finances of the producer.

Although MINEPIA has introduced a programme to build pig slaughterhouses and is currently building two in the region (Menoua and Haut-Kam), but they are not functional. Slaughtering of cows is also done on the ground at the sales point and few are subject to veterinary control.

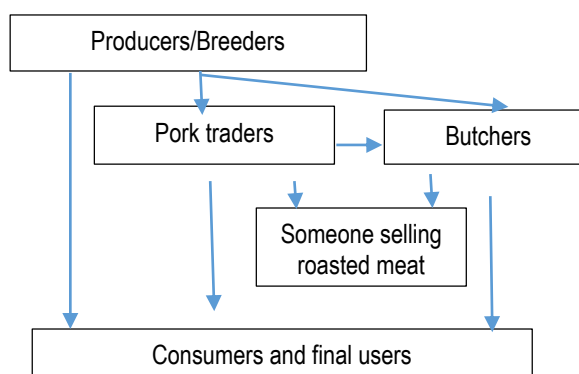
Photo 2: Slaughtering and sale at local markets (Mifi).



4.1.2.5. Product distribution channel

The pork distribution chain in the region is well structured to allow the product to circulate easily, with specialized operators at each level. However, the physical organisation of pig distribution chain does not ensure a better match with market conditions and good hygiene conditions necessary for trade.

Figure 2: Pork distribution chain



Marketing is carried out in markets spread throughout the region. The main local markets are: Casablanca in Bafoussam (open daily), Mbouda market (every four days), Tsinfen market in Dschang, B market in Bangangté, Bandjoun market (every four days).

There are pig meat processing cooperatives in the region, mainly in Koung-Khi (Cooperative Society for the Processing of Pork Meat) and Menoua (CIG POCHAME).

4.1.2.6. Main constraints.

The potential of pork production in terms of meat quantity is important in the region and is capable of considerably reducing the deficit in animal protein in Cameroon. This is an excellent opportunity to achieve animal protein self-sufficiency in an ever-increasing population. From an environmental point of view, pig farming can be carried out in a limited space, and to a certain extent, without damaging natural resources. But to benefit from this activity in the long run health problems must first and foremost be solved.

4.1.3. Poultry farming

With a 1% GDP contribution, the poultry sector in Cameroon is a significant component of the primary sector. The West is Cameroon's leading poultry region, especially in terms of commercial production of broilers and table eggs. Indeed, poultry farming occupies an important position in the region's economy, and beyond that in the national and sub-regional economy.

"West alone produces nearly 80% of Cameroon's poultry needs and 60% of those in Central Africa. A day of no activity in the West means CFA francs 1.1 billion (1.6 million euros) lost.

Mr. Bernard Njonga at AFP.

4.1.3.1. Production system

In the region there are two livestock systems, local livestock farming and modern or commercial livestock farming. Local breeding is mainly carried out with rustic and very diversified local breeds of chickens. This is a widespread practice in almost all households, especially in rural areas. This type of farming encounters a huge amount of loss of livestock due to the New Castel disease. However, there are initiatives to improve this type of breeding, in particular through prophylactic monitoring, or the production of chicks resulting from the crossing of local breeds with exotic breeds because of their growth performance.

Commercial livestock farming in the West Region is highly developed and can be divided into three main categories:

- Semi-intensive livestock farming: sometimes practiced as a secondary activity and with reduced bands. Poultry numbers range from 250 to 500 heads. Production techniques are rudimentary. The production infrastructure consists of hen houses made of temporary materials, feeders and water troughs made locally. These small farmers supply more than 70% of the broiler market.
- Intensive livestock farming: the bands has more than 5,000 poultry. It includes the production of table eggs and broiler chicken. Buildings are generally made of permanent materials. Zoo-technical animal husbandry standards are respected and particular emphasis is laid on biosecurity conditions. Almost all farmers raise them from laying chicks to hens. The majority of locally produced eggs are made on the ground, with the pathological problems that are found in such a system. Most farmers have small feed manufacturing units.
- Industrial livestock farming: this category includes breeders, broiler producers with bands ranging from 25,000 to 50,000 and egg producers with size ranging from 50,000 to 450,000 layers. The main operators are local companies more or less affiliated by joint venture with multinationals. Breeding is done in batteries. Breeders use imported relatives (one day-old chicks or fertilized eggs). Producers buy one day-old chicks locally or import them depending on supply and market conditions.

4.1.3.2. Livestock

According to EPA stat 2012, 10.4 of the local chicken farms are located in the West. Women and young people represent a large proportion of owners. Concerning the breeding of exotic species, the main strains of poultry exploited are: Abbor Acress, classic Hubbard and Hubbard F15. Concerning laying, strains of poultry producing red eggs are used, including Delka Brown, Lohmann Brown, Novogen Brown. According to statistics provided by the DR/EPIA, the evolution of the poultry population in the region and per division over the last three years is presented in Tables 6 and 7.

Table 6: Evolution of poultry livestock during the 2015 to 2017 period

	2015 YEAR	2016 YEAR	2017 YEAR
Flesh chicks	1,062,981	247,360	1,076,928
Spawning chicks	367,273	79,375	201,400
Chicken cockerels	51,355	52,280	14,565
Broilers	1,561 731	644,128	472,296
Laying hens	2,402 645	2,784,107	2,267,231
Reformed hens	149,920	167,443	195,515
Coquelets	47,993	46,482	6,750
Village chickens	785,790	743,314	794,200
Reproducers	187,585	275,066	44,827
Ducks	39,862	74,471	52954
Peacocks	05	6,255	13
Pigeons	14,101	124,819	13,651
Guinea fowl	515	1353	409
Turkeys	5,555	5,769	5,893
Quails	7,510	7,575	2,215
Geese	5,009	4,200	4,721

Source: DR/EPIA, 2017

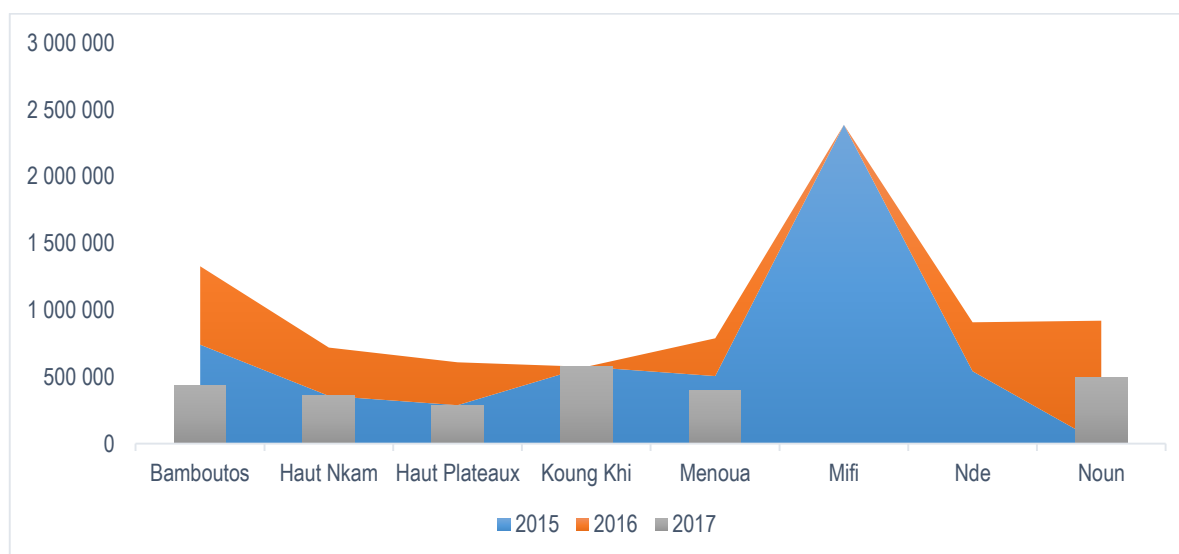
Table 7: Evolution of poultry livestock per division in the region

Year	Bamboutos	Haut Nkam	Hauts-Plateaux	Koung-Khi	Menoua	Mifi	Ndé	Noun
2015	742,188	358,385	287,921	576,539	506,802	2,388,362	543,725	1,285,908
2016	587,295	360,626	322,131	469,199	281,901	1,953 732	366,518	922,440
2017	434,410	360,626	287,371	581,732	399,108	1,503 208	1,170 058	493,037

Source: DR/EPIA, 2017

It appears that the main poultry production areas in the region are in the divisions of Mifi, Noun and Ndé.

Figure 3: Progress of poultry livestock per division from 2015 to 2017



4.1.3.3. Operators and infrastructure

Chicks raised in the West Region are supplied locally by private companies: EPA, ALIVET, FECAM Sarl, SOCIPAEL, and GROUPE AGROCAM. Most of these companies have production equipment based outside the West region, with the exception of FECAM Sarl and SOCIPAEL. This equipment consists of hatcheries.

In the West region, there are two poultry slaughter chains located in Bafang (Haut-Nkam) promoted by the Société des Produits Avicoles du Cameroun (currently non-functional) and in Bafoussam (FRESHCAM). Other modern poultry units include the Baleng table egg agropole, SIPREC cage farming, etc.

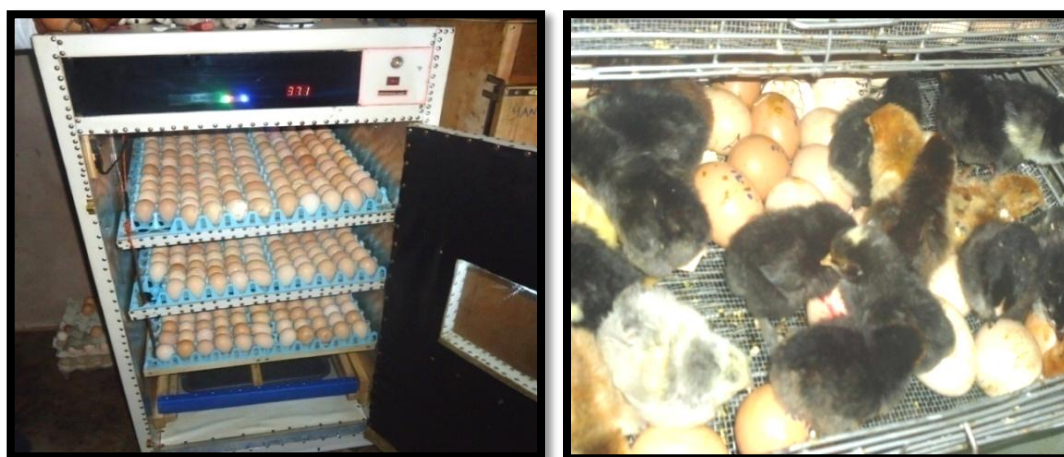
In the food sector, 132 feed mills (mixing mills) with warehouses for the sale of ingredients are located throughout the region. Private companies such as BELGOCAM, ELMAFI, SAPCAM, GROUPE AGROCAM, and multiple OPs are managing these structures.

The poultry sector has the advantage of having an inter-professional organisation (IPAVIC) in the region through which the State supports initiatives to relaunch the sector's activities.

Continuous supervision is carried out through the local services of MINEPIA and veterinarians in private practice, etc. The advantageous effects of the advisory support and area extension schemes set up by the ACEFA, PNVRA and National Employment Fund programmes are visible through the manner in which producers in the poultry sector implement techniques and technologies.

At the regional level, there is a Confédération des Groupes d'Initiatives Communes Agropastorales des Eleveurs de l'Aviculture Villageoise de l'Ouest (CONFEGAVIO) with about 600 members. The support provided to this sector by the German Cooperation (GIZ) has contributed to the improvement of the quality and number of livestock.

Photo 3: Incubator of local manufacturer and hatching of chicks (Mifi).



4.1.3.4. Egg production

The evolution of table egg production in the region over the last three years and per division is presented in the following table. The significant increase observed in 2016 is justified by considering poultry farms that had previously operated underground. However, there was a significant drop in egg production in 2017, due to poultry influenza declared in Cameroon in 2016.

Table 8: Egg production in the region between 2016 and 2017

Divisions	Laying hens	Village hens	Quails	2017 YEAR	2016 YEAR	2015 YEAR
Bamboutos	33,269 793	0	1,572	33,271 365	123,004,752	53,056 900
Haut Nkam					10,699 676	10,380,699
Hauts-Plateaux	34,154,001	424,361	3,348	34,581,710	23,861,629	57,868,194
Koung-Khi	75,800,000	242,160	0	76,042,160	70,702,000	90,534 410
Menoua	206,762,066	0	0	206,762,066	55,784,412	30,679,632
Mifi	331,007,349	25,528	187,039	331,219,916	707,647 651	301,378 824
Ndé	2,641 016	4,285		2,645,301	19,547 199	15,224,371
Noun	357,690	98,172	0	455,862	30,192 675	48,741,905
Baleng table egg agropole					232,000 000	251,250 000
2017 YEAR	683,991,915	794,506	191,959	684,978 380	*	
2016 YEAR	1,010,658 393	3,758 556	23,045		1,473,559 994 85,466.4 T	
2015 YEAR	999,793 043	778,971	401,676			1,000,973,690 58,056.5 T

Source: DREPIA, 2017

4.1.3.5. Related poultry products and link with other productive sectors

Poultry farming generates many related economic activities in the region. These activities are related to the preventive and curative health of livestock, farm equipment, feeding of flocks, treatment and packaging of products, storage and transport of products, treatment and enhancement of farm by-products.

Nutrition is the area in poultry farming that has led to the development of a related industry requiring large quantities of products and which directly links poultry farming to agriculture or other animal production chains. Indeed, the production of feed according to the types of poultry speculation requires agricultural products and by-products (maize, soya meal, palm oilcake, cotton cake, wheat bran, etc.), livestock (blood meal, bone meal, shredding, iron sulphate, fish meal). These different products can be of local or imported origin. For example, maize requirements (the main component of feedstock) are much higher than local production. Some institutions, such as SPC, import maize from other parts of Cameroon, and even from abroad.

In return, the operation of the various poultry farms generates large quantities of manure and dung that are valued in agriculture and constitute an added value for the poultry sector.

4.1.4. Rearing of small species (sheep, goats)

4.1.4.1. Breeding system

Small ruminant farming is practiced throughout the West Region. The breeding method is mainly extensive and marked by divagation in the dry season. In the growing season, animals are kept either in pens, kept in the stake, or kept by shepherds or young children. The effects of divagation are the damage to off-season crops and with conflicts between farmers. There are also frequent accidents in villages along major roads.

There are some semi-intensive livestock farms, mainly in the Noun. Livestock are raised on improved pastures, food supplementation and health monitoring are regular. The breeding of small species in the region is an opportunity for young people in rural areas to make resources. Semi-urban breeding of small ruminants is also a phenomenon that is increasingly widespread in all towns in West Cameroon.

Sheep breeding is dominant in the Noun for its interest in Muslim festivals, although pockets exist in Haut-Kam and Menoua while goats are more widespread in the Bamiléké territory because of their important eating habits and the cultural value of this species.

Small ruminants reared throughout the region have very significant economic benefits. This activity does not require a huge investment compared to cattle breeding. Another economic advantage is that the invested capital is quickly recovered because the reproductive cycle is short.

4.1.4.2. Livestock

According to the DR/EPIA, the herds in 2017 are around 92,588 goats and 59,615 sheep. Noun division, which is the largest production basin and holds 65% of the sheep size and 45% of the goat size.

Sheep breeds are of Sahelian origin: dwarf sheep (Djallonke sheep), Fulani sheep breeds (two-coloured Oudah sheep (white-black), two-coloured Oudah sheep (white-red)). Among goats, the most common breed is the guinea dwarf goat

They are generally rural animals. Goats in particular are highly prolific and have a high fertility rate. The percentage of annual births and the frequency of multiple births are higher than with the sheep.

4.1.4.3. Operators

According to Planchenault's surveys on livestock productivity in Cameroon (1992), small ruminant farming is practiced by a large number of cattle breeders but can also be associated with other species. Women and young people play a very important role in this type of farming. Within the framework of the Support Project for the Development of Small Ruminants financed by MINEPIA, regional federations of small ruminant producers have been set up.

The operators in the sector benefit from the supervision of MINEPIA and many NGOs. The diagnosis of specific diseases is carried out by LANAVET. This laboratory also produces the vaccine against the small ruminant plague. The University of Dschang has also carried out numerous studies on the characterisation of local breeds and the improvement of the diet of small ruminants.

4.1.4.4. Processing structures

There is actually no processing structure for small ruminants in the region. Slaughter takes place either in slaughterhouses intended for large livestock or in homes in most cases.

4.1.4.5. Compulsory breeding of small species.

The poor mastery of livestock management techniques, especially on their proper feeding, particularly during the dry season, and the control of diseases like small species plague, are major constraints that affect the small species production system in the region. In addition, the extensive livestock farming method is a source of agro-pastoral conflicts in this densely populated area.

The small fattening or breeder company would be profitable but requires, for good production conditions, a minimum of land access for fodder crops, which is not the case.

4.1.5. Non-conventional breeding

4.1.5.1. Breeding system

The breeding system is generally traditional regardless of speculation. Nevertheless, there are some rare cases of semi-intensive production for cane-rats farming in the West Region. Non-conventional livestock farming is supervised by the local structures of MINEPIA. The PAPENOC project, which was the main platform in this field, contributed to the creation of a federation of cane-rats breeders.

Production techniques for almost all of these non-conventional species are still poorly understood. The same applies to the distribution chains of the products of these farmhouses, making it difficult to assess the quantity of meat produced by these farmhouses, livestock and stakeholders in the sector.

The University of Dschang, in partnership with a few international organizations, has a platform for the promotion of guinea pigs, called "Project Cobaye". This platform aims at studying, diversifying and popularizing caviaculture in the West region and beyond throughout Cameroon.

4.1.5.2. Operators and marketing

Producers are the main link in the production chain and whatever the statistics, there are very few participants both upstream and downstream of the chain. The marketing of products from non-conventional livestock farming remains essentially local. Supplies are made at the farm and sometimes at the market. But there is not yet a real market for marketing the products of non-conventional livestock farming.

4.1.5.3. Species

Small unconventional but marginal livestock farming is becoming increasingly common in the region. It mainly concerns cane-rats, snails, rabbits, guinea pigs, Gambian rats and quails. There is an increasing demand for promoted species because of their so-called therapeutic virtues. Despite strong market demand and high profit margins often generated by producers, this type of farming is still underdeveloped.

4.1.5.4. Livestock infrastructure

In non-conventional livestock farming, infrastructure is often one of the items of expenditure that hinders the establishment of farms, either because of the cost of materials or because of their unsuitability. Some farmers are obliged to limit their livestock to avoid overcrowding, which is a source of mortality and has a negative impact on the profitability of the farm because in order to quickly make it profitable in conventional farming, it is necessary to have a large number of employees.

The majority of farmers in the region, in addition to the fodder collected here and there for animal feed, use feed made from broilers or laying hens as a feed supplement for their animals.

4.1.5.5. Constraints

In addition to diseases of which very few can be controlled, the major constraints to the development of non-conventional livestock farming in the region can be: the lack of trained producers, the low level of basic supervisors, the unavailability of many inputs, especially concerning genetic material, the low level of finance for activities, the predominance of traditional livestock farming which limits income, the high mortality of animals as a result of poor livestock management, the poor organisation of livestock farmers, etc.

4.1.6. Bee-keeping

Honey and other hive products are available throughout the country. However, bee-keeping production is dependent on the richness of the area in honey plants. The West region of Cameroon is one of the most productive basins in the world.

4.1.6.1. Systems

MINEPIA, in order to diversify livestock activities in all agro-ecological zones of the country, has set up the Beekeeping Sector Development Programme. This programme has made it possible to provide beekeepers in the region with adequate equipment to improve their various productions.

Beekeeping, although underdeveloped, is an activity practiced in the various divisions of the West Region. However, the divisions of Bamoutos, Noun and Hauts Plateaux are the main basins for the production of honey and bee-keeping products. Two production systems are observed in the region:

- The extensive system in which hives are made of bamboo. The crevices of trees are also used. It is characterized by low yield and under-utilisation of the hive. Swarming occurs naturally and generally during the rainy season, which is the flowering period for many plants.
- The semi-intensive system is characterized by the use of so-called Kenyan hives made of boards and recovery plates. The exploitation of the hive is improved by the possibility of extracting its by-products. The Kenyan hive is suitable for the production of comb honey. In addition, it produces queens and royal jelly necessary for the life of the hive.

4.1.6.2. Species

The bees found in Cameroon and the region are of the *Apis mellifera* Andasoni subspecies. Others living in the wild and exploited by honey hunters are: *Apis dorsata*, *Apis laboriosa* and *Apis florea*

4.1.6.3. Infrastructure and production

The main infrastructure is the stations and collection centres for hive products. The West region has 04 collection centres, including a honey extraction laboratory based in Bamessingué.

Honey production in the region increased from 99,854 tonnes in 2016 to 66,131 tonnes in 2017. According to the technical services, the DR/EPIA is responsible for this drop in production due to a lack of producers.

The region's beekeepers are grouped into CIGs (61 CIGs of beekeepers registered in 2016) and with the MAO (Maison des Apiculteurs de l'Ouest) as a potential umbrella organisation. Unfortunately, the latter is not yet operational.

Bee-keeping products that are sold are honey, wax, propolis, royal jelly and pollen. The selling of wax and propolis is organized into supply networks. After harvesting, the honey is brought back to the collection centres (MAO, Honey Extraction Laboratory in Bamessingué) where it is processed and packaged for marketing. For private individuals, after harvesting, the honey is directly packaged in the bottles and sold in specific structures or along the roads.

4.1.6.4. Operators

Beekeepers in the region are generally men, but there is an increasing participation of women. The trade in hive products involves collectors and distribution centres. The collectors are located in areas with high bee-keeping production centres. In the distribution chain, there are producers themselves, wholesalers, small traders and retailers in towns.

4.1.6.5. Constraints

Concerning health, cases of varroa mite, American foulbrood, and brood disease have been reported in the West Region. In addition to these health problems, the lack of financing, poor control of production techniques, insufficient inputs and the isolation of certain production areas are all obstacles to honey production.

4.1.7. Animal health - Health and veterinary inspections

Animal diseases are an important limiting factor for livestock development in the West Region. The three most popular and severe diseases that affect the poultry sector is avian influenza while the pig sector and the small species sector is affected by African swine fever.

The animal health sector also deals with health and veterinary inspection (VHS), whose purpose is the protection of consumers against zoonosis; preventing disease through the vaccination of animals and the treatment of curable diseases.

Health protection activities and veterinary public health are organised in the region around three main areas:

- Veterinary health inspection operations in slaughter facilities, markets and the maintenance of meat stamping operations;
- the strengthening of surveillance of epizootic diseases, more especially avian influenza, diseases among all livestock and the updating of the epidemiological map of the region;

- Monitoring the activities of veterinarians in private practice with an update of the lists of veterinary pharmacies and branches and the fight against the fraudulent sale of veterinary drugs.

Following the 2016 Avian Influenza, MINEPIA with its various structures and the technical and financial support of its partners triggered a major mobilization and awareness campaign among all stakeholders in the sector (DREPIA-West staff, administrative authorities, municipalities, FMO and IPAVIC). This has made it possible to limit and control the spread of this epizootic and to overcome it.

In addition, outbreaks of African swine fever (ASF), foot-and-mouth disease (FMD), contagious bovine pleuropneumonia (CBPP) and small ruminant influenza (RPA) have also been controlled in the West Region.

4.2. Fishing and fish farming

4.2.1. Structure and characteristics of fisheries

4.2.1.1. Location of sites

The region has a dense hydrographic network including lakes, rivers, dams and many sites suitable for aquaculture. This river system offers considerable exploitable potential for a wide range of fish species. The narrow valleys that separate the different plateaus are occupied by rivers and vegetation dominated by raffia. The diversion of most of these watercourses has allowed the development of small ponds (less than 500 m²) and more recently above-ground fish tanks. The Noun and Nkam are two rivers where fishing activities are mostly carried out. Fishing activities are also observed in some natural lakes (Baleng, Mount Bapit, Njindum, Peptonun) and artificial dam reservoirs (Bamedjin and Mapé). One activity that can be particularly valued in the Nkam Valley in Santchou is the collection of catfish from their natural environment for aquaculture purposes (Pouomogne, 2008).

4.2.1.2. Fisheries

Inland fishing is carried out on the region's water bodies, the most important are the Mapé and Bamedjin lakes. These last two water bodies are the most important in the region in terms of production and post-capture activities.

It is essentially artisanal, taking into account the characteristics of the ecological environment. The 3207 participants identified in 2016 belong to five nationalities: Cameroon, Nigeria, Niger, Benin and Mali (see Table 9). The Noun division with the Mapé reservoir and the river whose name was derived from the division has the highest number of people. Unlike what is observed in the maritime sector (MINEPIA, 2014), Cameroonians are the highest carrying out fishing activity in the area (more than 80%).

Table 9: Number of fishermen by nationality in the West Cameroon region in 2016.

	Cameroonian	Citizen from Niger	Nigerians	Citizens from Benin	citizen from Mali	Total
Bamboutos	71	6	0	1	0	78
Haut Nkam	22	0	0	0	0	22
Noun	1529	171	1	0	127	1828
2016 TOTAL	1622	177	1	1	127	1928
2015 TOTAL	2,673	177	0	1	174	3,207

4.2.1.3. Operators

A large community of fishermen and secondary participants lives in villages and fishing camps situated along rivers and water bodies and around lakes and dams (Mapé for example 2618 fishermen and 1690 other participants for a total of 4308). The majority of these fishermen are Cameroonians.

The low number of foreign fishermen in inland fishing is an asset for the implementation of co-management programs on these water bodies. These are also being noticed in the Mapé dams.

Concerning fishing villages and camps, out of the 654 in the national territory, 128 are in the Mapé area, which could suggest a significant fishing capacity in the area and therefore overexploitation of fishing resources in the absence of a management plan.

4.2.1.4. Species

Hemichromis sp, Clarias sp and Heterobranchus sp (catfish), Barbus sp - Labeobarbus (carp) and Oreochromis niloticus (tilapia) are the most common species. The annual production value of captured fish in 2016 is estimated at 1400,243 tonnes, dominated by tilapia (745,271 tonnes), followed by catfish (325, 42 tonnes). Noun division has provided the largest quantity of fish, more than 90% of which were Hemichromis sp, Clarias gariepinus (catfish) and Oreochromis niloticus (tilapia). In Bamboutos, outputs are dominated by cyprinids of genera Barbus and Labeobarbus.

4.2.1.5. Production Means

These include boats and fishing equipment. Concerning boats, Djifonjou (2000) reported 2024 in the Mapé. The boats recorded are generally monolithic canoes, plywood canoes or large canoes made from plank.

Bamendjing in Bamboutos division, sheet metal boats are also present. The transportation rate of less than 1% (see Table below) reflects the instability in the working conditions of these fishermen.

As for fishing equipment and techniques, fishermen use them according to their tradition, the material and financial resources available, the seasons and the fish species sought. The number of equipment used in the region's fishing activity is difficult to determine in the absence of statistical data.

The net (including the Malian Gourah ²) is predominant among fishing equipment, making it very difficult to implement a sustainable selective fishing policy. The lines and hooks come next, highlighting relative poverty of the majority of participants to be able to acquire more efficient equipment (cf. Table below). While this can contribute to the conservation of the resource, it is far from ensuring its sustainability: any natural resource that does not allow man to sustainably meet his basic needs is likely to decline in one way or another.

Table 10: Number and types of fishing boats used by fishers in the West Cameroon region in 2016.

	Monoxylated paddle/sail canoes	Boat canoes + engine	Sheet metal canoes	Boat canoes without motor
Bamboutos	37	01	10	48

A trap of Malian origin, a kind of trap containing cereal bran cake bait to attract fish, mainly from the ka family of Cichlidae.

	Monoxylated paddle/sail canoes	Boat canoes + engine	Sheet metal canoes	Boat canoes without motor
Haut Nkam	00	00	00	04
Noun	5	12	00	1652
2016 TOTAL	42	13	10	1704
2015 TOTAL	46	13	10	2,420

Table 11: Types of fishing equipment recorded in the West Cameroon fisheries

	Divisions				
Fishing equipment	Bamboutos	Noun	High Nkam	Total 2016	Total 2015
Fishing rods	2340	151	0	2491	2818
Hawk	40	517	6	563	853
Bottom gillnets	35	1 110	17	1162	1219
Surface gillnets	60	2090	0	2150	2527
Hooks	0	3870	0	3870	4620
Lines	22	420	113	555	9935
Nets	0	4727	32	4759	4922
Bait longlines	0	702	0	702	230
Unlimited longlines	0	1986	0	1986	1710
Malian gururs	0	2785	0	2785	8250

4.2.1.1. Shores

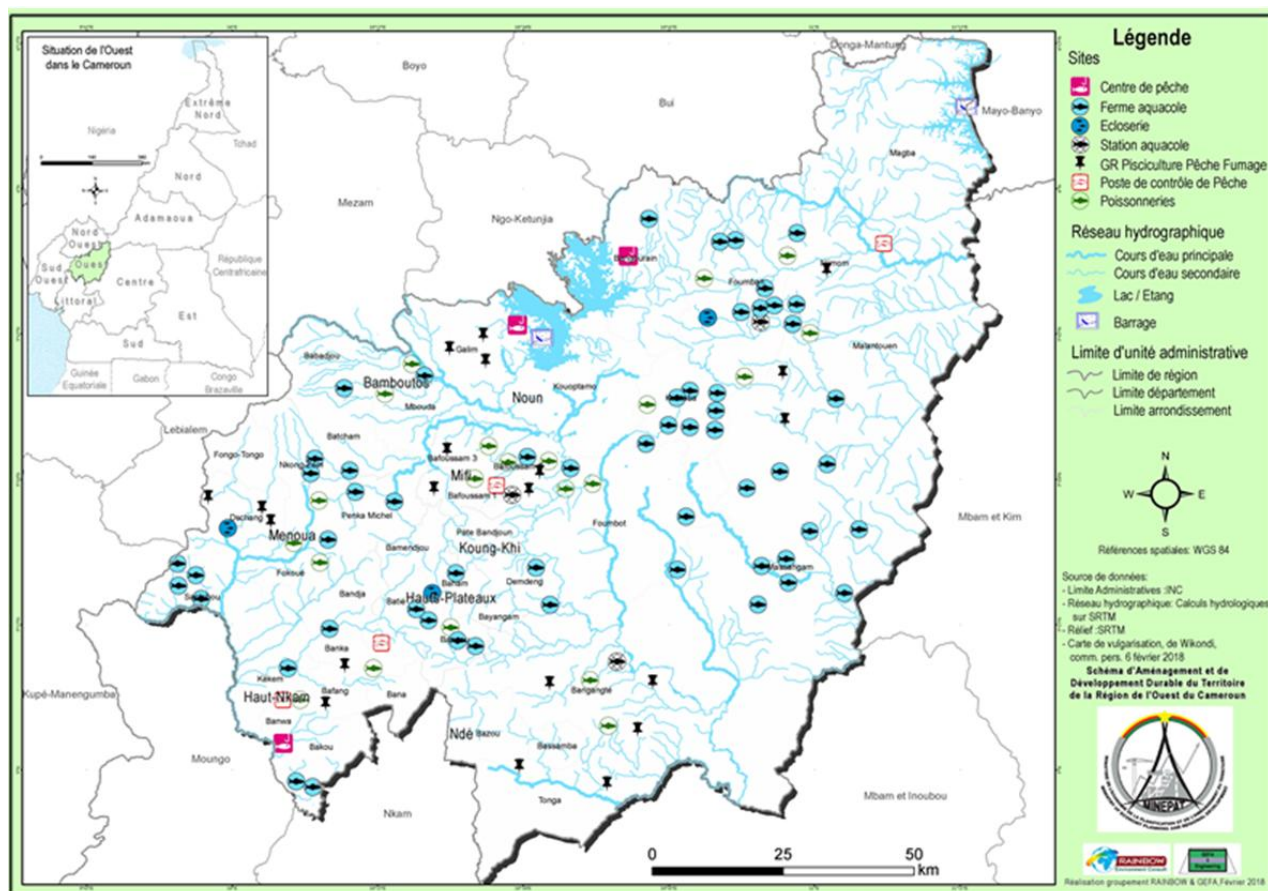
Shores and fishing camps are often landlocked, banda and more rarely Chorkor smoking rooms are set up by fishermen and their families to ensure the conservation of fish while waiting for when they are sold. At the level of main fish markets, the decentralised public authorities have built an ice factory unit at Mapé (Matta Dam) and fish sales halls in Magba and Bamedjin

In the three divisions with intense fishing activities (Bamboutos, Haut Nkam and Noun), the output situation in the 1st half of 2016 is presented in table 12 below.

Table 12: Amount of fish caught in water bodies in the West region of Cameroon in 2016 (in tonnes)

Species found in the Divisions	Carp		Hemichromis		Catfish		Tilapia	
	Fresh	Smoke d	Fresh	Smoked	Fresh	Smoked	Fresh	Smoked
Bamboutos	9,919	4,327	0	0	10,807	6,872	15,407	11,461
High Nkam	0	0	0,20	0	0	0	0,53	0
Noun	0	0	143,126	171,974	74,51	233,237	147,362	570,511
Total 2016	9,919	4,327	143,126	171,974	85,317	240,109	163,299	581,972
Total 2015	26,388	10,269	18,637	449,4	31,864	278,548	56,541	537,582

Figure 4: Fishing and fish farming sites in the West region of Cameroon



Source: Extension map, from Wikondi, pers. comm. 6 February 2018.

1.1.1.7 Processing and marketing

Concerning the national total in the continental field, the region boasts of a 1/5 contribution (MINEPIA, 2014). This production builds a sector generating revenues close to CFA Francs 1 billion, with a preponderance of smoked products due to the current isolation of production sites from the main consumption centres. The average selling price of fresh fish is 1050 F and that of smoked fish is 1300 F per kg. Smoked catfish remains the most popular commodity among consumers.

Table 13: Income from fresh and smoked fish sectors in the West region of Cameroon in 2016.

Sector of activity	Fresh supply chain			Smoke chain			Total	
Division	Quantity (in Kg)	Average price (FCFA/Kg)	Resources generated (in million FCFA)	Quantity (in Kg)	Average price (FCFA/Kg)	Resources generated (in million FCFA)	Quantity (In Kg)	Resources Generated (in million FCFA)
Bamboutos	36133	700	25,293	2266	700	1,586	38399	26,879
High Nkam	730	1000	0,730	0	0	0	730	0,730
Noun	364998	1450	529,232	975722	1900	1854	1340710	2383,232
Total 2016	401861	/	554,525	977988	/	1855,586	1379839	2410,841
Total 2015	118 685	/	412,4	254338,6	/	499,4	121 588	911,8

The marketing chain for local fishery products is relatively short:

- Fresh fish: Fishermen – bayam-selam³- consumer
- Smoked fish: Fishermen - women fishermen (smoking) – bayam-selam - consumers.
- Ready-to-eat fish: bayam-selam is at the same time the housewife who prepares the fish in sauce for the consumer.

The output from the marketing of smoked fish are collected to be processed into fishmeal valued as animal and fish feed (average price in 2017, 450FCFA/kg, against 900FCFA for flour imported from Belgium).

In short, the West region of Cameroon has a considerable potential of sites and fishery resources exploited by 3,200 relatively poor fishermen, with a contribution to national wealth of nearly CFA Francs 1 billion. It also has species with high potential for aquaculture, with work on domestication initiatives avoided by research professors from the Faculty of Agronomy and Agricultural Sciences of the University of Dschang (FASA), namely *Labeobarbus* (Tiogue, 2013) and *Clarias jaensis* (Zango, 2017). The dynamism of the associations is also appreciable with more than 60 OPs. As a result, in collaboration with the adjacent fish farming sector, we can expect improvements in the fisheries sector in the coming years.

4.2.1.2. Organisation of the sector

In general, there are few professional organisations in the region whose main role is to defend the interests of the profession and their members before local authorities. Many fishermen's associations have been set up falsely as part of sub-sector development projects to benefit from subsidized inputs.

However, since 2002, the co-management process has been in place on certain water bodies such as the Mapé as part of aquatic resource management. The achievements of this co-management process include an effort to improve the organization of participants and strengthen their capacities, the institutionalization of biological rest, the establishment of management committees and the signing of management agreements negotiated by the stakeholders.

The perceptible impacts of this process include the strengthening of social cohesion, respect for biological rest, the establishment of a dialogue between the various stakeholders, the involvement of the fishing communities concerned in management and local development and finally a solid collaboration between the stakeholders and the fisheries administration.

4.2.1.3. Constraint on the development of fishing in the West

Apart from the situation of the livelihoods of stakeholders already mentioned, as in most fisheries in sub-Saharan Africa, there is a recurrent occurrence:

- Absence of public authorities to monitor the environment and fishing activity in accordance with the standards suggested by the FAO Code of Conduct for Responsible Fisheries (William *et al.*, 2012). Relatively well-designed environmental and social management plans for dam reservoirs (Mapé, Bamedjin) are available, but they are not really implemented. We can observe the silting up of water bodies, the regression of the natural food that is favourable for the development of the fishery resource, the development of diseases including a nematode that was at the origin of the decline of the catfish size in Bamedjin. Communication channels that would not only facilitate

³ A term commonly used to designate the link in the chain, usually women in the artisanal fisheries sector in Cameroon, through whom the food acquired directly from the producer is transported for sale to the consumer. Transport, storage/exhibition/preservation costs on the markets are minimized.

the presence of fresh fish of better quality closer to consumers, but also better monitoring of fishing areas by stakeholders, are emerging; the popularization of improved conservation methods to reduce pressure on wood from coastal forests, the availability of appropriate fishing equipment for sustainable exploitation of the resource, remain a marginal concern for the regulatory authority; the latter are clearly more concerned with the collection of health inspection fees.

- Prohibited fishing practices (IUU fishing⁴), and the development of spontaneous fisheries. Only 51 Local "E" fishing licences were issued to the more than 3000 active fishermen in 2016.

The present inability of CACP fishing centre managers to effectively implement the resolutions of the co-management committees outlined in the production sites by the various stakeholders. In Mapé, where sustainable fisheries management measures are the most advanced (with the publication of prefectural decrees instituting biological rest periods⁵), the situation is not much better. In the absence of fisheries surveillance equipment on the part of MINEPIA decentralized officials (light motorized boats), and even of a certain complicity of the latter by an attitude of corrupt clients, conflicts between Cameroonian and Nigerian fishermen are recurrent, due to a greater capacity of the latter to use prohibited equipment to carry out IUU fishing, thereby plundering the resource in the face of the former, often less equipped.

- Large volumes of post-harvest losses linked to the isolation of fishing villages and the poor promotion of conservation techniques that respect the fishing environment.
- it is not appropriate that the body that is supposed to provide advice and supervise the activity (Head CACP) should be the same that collects taxes and coordinates enforcement; if necessary, it should be the judge and party from the outset.
- In addition, regulatory/control measures must be based on scientifically proven biological bases. Consultation between resource managers in the field (CACP, stakeholders) and fisheries researchers (CNFZV and IRAD in Fouban, FASA of the University of Dschang, ISH of the University of Douala, specialized NGOs) to establish such data is therefore essential.

4.2.2. Aquaculture

4.2.2.1. Features and characteristics

Aquaculture is still underdeveloped in the region although it has been introduced in recent decades. The climate, the topography of the region, the nature of the soil and the endemic fish resources are quite favourable for the development of fish farming

The area has proven biophysical potential, but does not yet benefit from other conditions that favour the development of aquaculture, such as the presence of communication routes and management structures.

⁴ IUU: illegal not regulated not reported. Illegal (catching prohibited sizes, or in protected areas), Unregulated (fishing without authorisation, therefore without a licence, and even in the case of the right of use, non-compliance with the clauses attached to it such as respect for protected species or contribution to statistical data), and Unreported (landing outside established landing areas and avoiding the registration of those responsible for fisheries statistics).

⁵ The last Prefectural decree institutes biological rest from July¹ to September 30, 2016

4.2.2.2. Production system

There are two main aquaculture production systems in the region. These are extensive and semi-intensive fish farming. A third system was introduced recently, above-ground, cage and closed-loop aquaculture, is being expanded.

4.2.2.2.1. Extensive fish farming

In this system, livestock are kept in poorly designed ponds. Fish feeding methods are traditional. Fish are fed with organic or household waste or animal excrement. Moreover, this feeding method is often inappropriate

4.2.2.2.2. Semi-intensive fish farming

It is the most widely used system in the region. It is dominated by ponds whose management is more or less controlled. To intensify production, additional food and fertilizers (compost) are provided to strengthen the algae chain on which fish feed. In addition to compost, fertilization can be provided by chicken house waste.

In recent years, intensification has resulted in the development of above-ground infrastructure (concrete bins, plastic sheeting, nets and cages) in the region's 8 divisions.

In 2016, 453 fish farmers with 1622 ponds with an average surface area of 335 m² were identified in the 8 divisions of the region). The unavailability of young fish has led many fish farmers to abandon their ponds. Thus, nearly 60% of the region's infrastructure could not be operational due to poor access to quality young fish. The specificity of the region in relation to the whole national territory must nevertheless be highlighted: the commercial collection of young fish from catfish in the natural environment in the Santchou region (Menoua division). The main system is semi-intensive aquaculture, with ponds mainly in diversion.

Table 14: Number of fish farmers and inventory of fish farming infrastructure by division in the West region of Cameroon in 2016

Division	Ponds					Young fish rearing stations (state / private)	Number of fish farmers
	Active ponds	Surface area (m ²)	Abandoned ponds	Surface area (m ²)	Type of pond		
Bamboutos	11	3 200	22	13380	Bypass, Dam,	00	10
High Plateaus	112	141025	31	12095	Derivation, Series	01	32
High Nkam	94	75 294	40	4650	Diversion, Dam, groundwater	00	32
Koung Khi	34	9 800	11	1 100	Bypass, Dam,	00	14
Menouaa	170	24384	566	26344	Diversion, Dam, groundwater	02	180
Mifi	39	14 591	20	5500	Bypass, Dam,	00	25
Ndé	47	7600	17	13 760	Bypass, Dam,	01	38
Noun	150	42015,63	258	148186,9	Derivation, Tablecloth series	02	122

Division	Ponds					Young fish rearing stations (state / private)	Number of fish farmers
	Active ponds	Surface area (m2)	Abandoned ponds	Surface area (m2)	Type of pond		
Total 2016	657	317909,63	965	225015,9		06	453
Total 2015	627	288 806,9	955	101 686		06	440

4.2.2.1. Species

The main species reared are: tilapia (*Oreochromis niloticus*), African catfish (*Clarias gariepinus*), kanga (*Heterotis niloticus*) and common carp (*Cyprinus carpio*). Snake fish (*Channa obscura*), panther fish *Hemichromis facciatius* and local catfish (*Clarias jaensis*) are among the numerous species found in the ponds.

Tilapia and carp young fish are more commonly produced in the Highlands (IOGC hatchery) and catfish young fish are mainly produced in the two public hatcheries (IRAD and CNFZVH) located in the Noun (Fig. 3). The estimate of the Regional Service for Fisheries, Aquaculture and Fishing Industries (Wikondi, 2017), recorded a total of about 200,000 young fish, does not take into account catfish young fish collected from the natural environment and marketed by GIC PEPISA fishermen in Menoua (tab 8; Pouomogne, 2008).

Figure 5: Distribution of fish species pre division

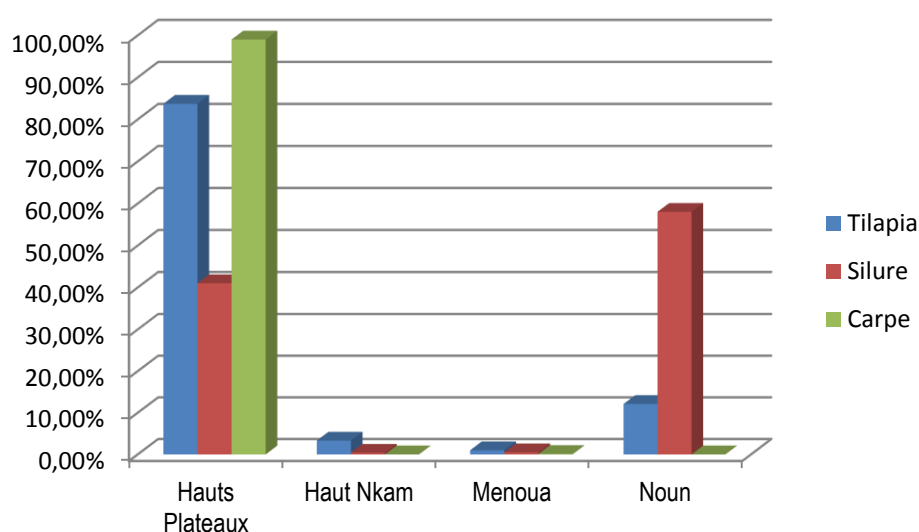


Table 15: Amount and destination of juvenile catfish* caught from the Nkam Valley in 2008

Customers	Quantities	Destination
Fishermen (as bait)	2000	Nkam Valley
Fish farmers (such as fry)	3000	Fokoue in Dschang
	200000	Santchou in Dschang
	10000	Bamenda
	20000	Kumba

* Two species, *Clarias gariepinus* and *Clarias jaensis*, are represented in the table.

Source: Pouomogne, 2008

4.2.2.1. Production

Unlike fishing which is the main activity in only three divisions, aquaculture is practiced in all divisions of the West Region. It is mainly represented by freshwater pond fish farming⁶ (see Photo 4), incorporated or not with livestock and crop production (rice farming in the Noun and Nkam areas).

Photo 4: Integrated fish farm (pigs) in Baham (Haut-Plateaux)



Source: Pouomogne, December 2017.

The West Region produced 55,863 tonnes of table fish in 2016, generating income of CFA francs 117 million. These data, which remain generally underestimated (Pouomogne and Pemsl, 2008), nevertheless make it possible to identify the divisions of Haut-Plateaux as the regional core of farmed fish production (see Table__; Wikondi, 2017). Regional fish production in 2017 is expected to be close to 200 tonnes, corresponding to just 1/10 which is below national production. Out of the 30 hectares of active ponds/bacs, the corresponding productivity would be nearly 7t/ha/year, slightly more than twice the figure usually observed in the semi-intensive system in Cameroon (MINEPIA, 2014). The observations to be done would be a continuous intensification of integrations, corresponding to an increased understanding of the functioning of aquaculture ecosystems in relation to quality management over time (presence of the University of Dschang and IRAD, and research and development projects strengthening the expertise of producers, hosting student interns from the ISH of the University of Douala) in an environment where access to land is relatively limited. In addition to the improved appropriation of the above-mentioned semi-intensive technical routes, it should be noted that there has been an increase here and there in the region in the number of above-ground breeding tanks promoted in recent years with the facilitation of public authorities by multinational companies selling extruded feed (Coppens, Skretting, Biomar); the under

⁶ While aquaculture includes all forms of aquatic aquaculture (algae, molluscs, fish shrimps, etc. in fresh, brackish and salt water), fish farming is limited to fish farming.

development Agropole in Bazou in the⁷ Ndé is a visible part of what is done in many private estates built in the ancestral heritage of the region's elites. The latter often reside in capital cities (Yaoundé, Douala) and even out of the country. It is expected that in the years to come, the volume of fish produced in above-ground systems will increase, although these systems are not very sustainable due to their dependence on imports.

Table 16: Table fish production and income generated in 2016 in the West region of Cameroon.

Division	Quantity of fish (in tonnes)	Average price per Kg (FCFA)	Resources generated (in millions of CFAF)
Bamboutos	11,5	2300	26,45
High Nkam	5,65	1000	5,65
High Plateaux	21,945	2 250	49,37
Koung Khi	8	2300	18,4
Menoua	2,711	2000	5,422
Mifi	1,92	2000	3,84
Nde	0, 60	1400	0,840
Noun	3,537	2000	7,074
Total 2016	55,863	/	117,052
Total 2015	54,2	/	102,2

4.2.2.2. Organization of producers

In the majority of farms, fishing activity is secondary. In general, viable fish farms are those whose promoters have successfully integrated pond fish production with the other priority components of EFA.

Supervision is carried out on a daily basis through the decentralized structures of MINEPIA (Centre Pêche CACP⁸), projects and NGO partners in the development of local inland fishing. With the decentralisation of the public powers, fishermen have gathered into CIGs and associations in order to better govern the use of the basic rare resources at their disposal (table 4).

Table 17: Fishing and fish farming OPs and main activity of each OP per division in the West region of Cameroon

Divisions	Name of the OP (Joint Initiative Groups - JIG or association)	Major activities
Bamboutos	GIC TSONZOG	Smoking of fish
	GIC FORYA	Fishing
	GIC TSIEGO	Smoking of fish

⁷ In partnership with the GIC AIO of Batié, this agropole and an expatriate close relative of the Minville, who has the means to qualify for this type of project initiated with the support of the Minepat. The farm currently has 3 ponds of 300 m² and 3 concrete tanks of 1-3 m³. Pending the construction of innovative infrastructures, improved breed catfish (from Nigeria) fed with imported floating feed are being grown in the existing ponds. The fry production facilities of the Batié IAG are being strengthened in order to support the sustainability of table fish production in Bazou.

⁸ Centre d'Alevinage et de Contrôle de Pêche, the most decentralized unit of MINEPIA to supervise fishing activity in Cameroon.

Divisions	Name of the OP (Joint Initiative Groups - JIG or association)	Major activities
	GIC PINTCHETSOU	Fishing
	GIC FOFEM	Fishing
	GIC ABE	Table fish
	GIC APEB	Table fish
	GIC PROFADUBA	Table fish
	GICTREFUTUN	Table fish
	GIC SODIM	Table fish
High Nkam	GIC AGRIPOR BAY	Table fish
	GIC Farmer of Bafang village	Table fish
	GIC MBOKA	Table fish
	GIC AE NZODEM	Table fish
	GIC ADERBA	Table fish
High Plateaus	LAG West Integrated Aquaculture	Table fish and young fish production
	GIC GDP	Table fish
	GIC GAAB	Table fish
	GIC Friend farmer from Bapa	Table fish
Koung Khi	GIC of the Kung Khi Farmers and Breeders Technicians	Table fish
	GIC JEAF	Table fish
	GIC K-FISH	Table fish
	GIC PROMO YOUNG	Table fish
	GIC Moukeng-houa	Table fish
Menouaa	Collective ICMs of integrated fish farmers in the West	Table fish and young fish production
	GIC of fishermen and fish farmers of Santchou (PEPISA)	Table fish
	Elongated and coop/ca sounds	Table fish and young fish production
	GIC AJA	Table fish
<u>Mifi</u>	Aquaculturist ICM	Table fish
	ICM of large fish farmers	Table fish
	GIC La Ferme	Table fish
	ICM of DEINGSO fish farmers	Table fish
	GIC PRODABIO	Table fish and young fish production
	ICM of volunteer fish farmers	Table fish
	GIC of the Farmers and Fish Farmers of Bamougoum	Table fish
	GIC Les Braves	Table fish
Ndé	GIC PROSELPA	Table fish
	GIC AGRIPIBA	Table fish
	GIC PROMA	Table fish
	GIC PICIBA	Table fish

Divisions	Name of the OP (Joint Initiative Groups - JIG or association)	Major activities
	GIC JOSSIBRI	Table fish
	GIC PARTAGONS	Table fish
	GIC ADYBAS	Table fish
	GIC NZEUGEUH	Table fish
Noun	GIC of La Ferme Agropastorale NCHARE de Fouban	Table fish
	GIC Matafirou	Table fish
	GIC AGROSPLAN	Table fish
	GIC Founougouon	Table fish
	GIC Fangigo	Table fish
	GIC of the fishermen of the Mapé dam (GIC PEBAM)	Fishing
	GIC Agro-pastoral de Magba et Bankim (GIC AMAB)	Fishing
	GIC des Jeunes Agriculteurs, Eleveurs et pêcheurs de Matta-barrage (GIC AGEPEM)	Fishing
	WestFarmers, Fishermen and Valiant Breeders ICG (APEVED ICG)	Fishing
	Association of Artisanal Fishermen of Magba (APAM)	Fishing
	Association des jeunes d'amitié de Matta-barrage (AJAMB)	Fishing
	Association des Jeunes commerçants et pêcheurs de Matta-barrage (AJCOPEMBA)	Fishing and marketing

Fish farming activity is more considered as a promising niche market for capture fisheries, which are experiencing a decrease in natural resources; in addition, fish farmers in the region have been able to set up a cooperative of west fish farmers.

5. Constraints to aquaculture development in the West Region

The West Region has many assets, but it remains subjected to the burdens faced by the aquaculture sector, which are often identified at the national level (Pouomogne and Pemsl, 2008; MINEPIA/FAO, 2009; MINEPIA, 2013; Pouomogne, 2013). The main constraints to be noted are: (i) scarcity of young fish and when available, poor quality; kept in the State portfolio of aquaculture stations disrupting private dynamics instead of facilitating its activity; (ii) unavailability of quality food at the affordable prices; (iii) poor access to credit for credible stakeholders⁹.

These factors are in fact only a consequence of the poor governance of this important sector of the national economy.

⁹ In practice, financial and material resources are currently made available as a priority to community elites (elected officials, CEOs, Ministers) without taking into account the beneficiaries' knowledge of the sector. The result is that the current initiative stops as soon as the funding ends, as the elite is relatively independent for its survival from the viability of the fisheries project. While it is understandable that these elites have a better management capacity, the experience can be readjusted by targeting not the political elite, but those who have a good command of the sector for having worked in it their working lives, and more and more people are retiring from the civil service.

Among the assets, and especially in the West region, it is worth highlighting the implication of the country's most highly rated training, research and extension institutions through demonstration: IRAD and CNFZVH Foumban Station, FASA of the University of Dschang. At the human level, the most experienced fish farmers due to the constraints of a relatively stern natural environment certainly can be found in these highlands in the west region of the country¹⁰. At the institutional level, Cameroon has a strategic framework for aquaculture development (Hishamunda *et al.* 2003) that has served as a reference in this area for several African countries (William *et al.* 2012). The same applies to the sector's master development plan drawn up in 2009 (MINEPIA/FAO, 2010).

6. GOVERNMENT PROJECTS AND PROGRAMS IN THE LIVESTOCK, FISHERIES AND ANIMAL INDUSTRIES SECTOR IN THE REGION

The Programme for the Improvement of Competitiveness of Family Agro-pastoral Farms (ACEFA) West

The implementation of the 2nd phase of the ACEFA Programme (The Programme for the Improvement of Competitiveness of Family Agro-pastoral Farms (ACEFA West) which started effectively in the West region in April 2013, is proceeding according to plan concerning the distribution of the advisory system, which now effectively covers the eight divisions in the region. Concerning the productive investment projects finances, several OPs have benefited from the programme's grants and have been supported in their implementation. The components of ACEFA are:

- the advisory support component;
- the Financing of OPs projects component;
- the coordination component.

In terms of training, 110 regional advisors and managers were trained.

About advisory support, the region has a total of 2,647 producer groups (PGs) and 52 agropastoral professional organizations (APOs), but 1,976 producer groups (22,659 members) and 48 agropastoral professional organizations (20,825 members) were effectively supported by the commission during the 2016 year. The remaining 671 PGs and 4 APOs were only integrated into the scheme in November 2016 and have therefore not yet been effectively supported.

The financing of producer organisations' productive investment projects was effective during the year. It is important to remark that project preparation took longer than expected for various reasons: the capacity building of advisors and the strengthening of project quality control.

Concerning the funding of PG projects, the situation is as follows:

- For the 2016 year, a total of 116 projects (115 for PGs+1 for APOs) were financed for a total amount of about CFA Francs 507,000,000.
- Since the beginning of ACEFA 2 (2013), a total of 142 projects (141 for PGs+1 for APOs) have been funded as shown in Table below.

¹⁰ It is worth mentioning a legendary personality in the history of fish farming in Cameroon, Mr. Youdom Bernard, a notable member of the Batié group in the Haut-Plateaux division.

Table 18: ACEFA 2 funding between 2013 and 2016

Domain	Registered Applications	Accepted Requests	Amount granted	%
Agriculture	117	49	162 614 683	25%
Breeding	151	91	438 277 566	74%
Fishing / fish farming	2	2	9 228 450	1%
TOTAL	270	142	610 120 699	100%

The regional coordination and all the advisors of the scheme, with the support of the MINADER and MINEPIA delegations, monitored the functioning of these funded projects.

Renovation and Vocational Training Development Support Project for the Livestock, Agriculture and Fisheries sectors (AFOP) During the January to November 2016 period, the activities carried out in the West Region by the C2D-AFOP Program were as follows:

- The continuation of the training of 258 (two hundred and fifty-eight) Farmers (EA), including 162 Men and 96 Women, in the region's 9 (nine) first, second and third generation centres (CFR of Bafoussam, CFR of Bafang, CEFAN of Foumban, Kounden Breeding Station, CEFORCO of Bafou, CFRA of Bandjoun, CFP of Koutaba, CIEFAD of Bangangté and EFA of Baleveng) under the supervision of 9 (nine) Directors, 32 (thirty-two) Monitors including 16 Men and 16 Women and 205 (two hundred and five) Referents including 158 Men and 47 Women;
- The continuity of the training of 166 (one hundred and sixty-six) Agro-Pastoral Entrepreneurs (EAP), including 105 Men and 61 Women in the two Schools (ETA of Bafang and CNFZV of Foumban) under the supervision of 2 (two) Directors, 15 (fifteen) Trainers and 58 (fifty-eight) Trainee Masters;
- Support for 238 (two hundred and thirty-eight) Farmers (EA), including 168 Men and 70 Women trained and integrated from 2014 to 2016 in 6 first and second generation centres (CFR of Bafoussam, CFR of Bafang, CEFAN of Foumban, Kounden Breeding Station, CEFORCO of Bafou and EFA of Baleveng) in the implementation of their projects by 6 (six) Insertion Advisers (C.I) including 4 Men and 2 Women ;
- Held 07 (seven) sessions of the Territorial Commissions for the validation of trained youth projects and 03 sessions of the Financial Commissions for the validation of trained youth projects in the West Region
- 62 Young EAs inserted in 2016 in 6 first and second generation centres in the West for a total amount of CFA Francs 92,859,266
- Temporal availability of 3 dormitories and 8 classrooms in 5 Centres and 02 Schools in the West Region
- Training of 225 active producers and 205 references
- Visits to youth project sites by members of the West Finance Commission to the 6 Training Centres.

7. SWOT ANALYSIS OF ANIMAL PRODUCTION IN THE WEST REGION

The main strengths, weaknesses, opportunities and threats (SWOT) in fisheries and animal industries in the West Region are summarized in the table below.

Table 19: Summary of livestock SWOT analysis in the West Region

FORCES	WEAKNESSES
<ul style="list-style-type: none"> - Favourable climate for practicing all types of farming, including aquaculture. - Large poultry (broiler, table and hatching eggs) and pig production basin - Large livestock, especially monogastric livestock - enthusiasm for the control of technical itineraries by producers - existence of an important market - strategic position of the Region, for the sale of products - Dynamism of the population - Presence of research centres and management structure - Presence of grazing areas - regular organisation of livestock vaccination campaigns - Available labour - Existence of training centres (FASA, national zoo-technical, veterinary and fisheries training centre of Fouban Agriculture, etc.) - Presence of projects and programmes (ACEFA, PRODEL, AFOP, etc.) - strong demand for fishery products - Presence of many pools adapted to fish farming - Strong presence of women in downstream activities (processing and fish trade). - Existence of a strategic plan for the sustainable development of aquaculture. - Growing interest in fish farming activities - Beginning of the installation of the cage or above ground tank farms. - Existence of many species of fish likely to be reared 	<ul style="list-style-type: none"> - no demarcation of agropastoral areas / invasion of pastures by farmers (no existence of the pasture map) - insufficient performance of genetic material - Complex procedures/mechanisms for obtaining financing (slowness) by producers - no processing plant - insufficient infrastructure and equipment (slaughterhouse, equipped water points, cold rooms, hatcheries for one day-old chicks, etc.) - absence of sample analysis laboratories - Insufficient veterinary staff and positions - low ratio between farmers and technical services - difficulties in accessing credit - insufficient public and private veterinary pharmacies/ poor quality pharmaceutical products on the market - Insufficiency of actual organized groups - Poor governance in producer organisations - Recurrence of endemic diseases (swine fever, avian influenza, red mullet...) - Non-compliance with hygiene rules and measures used in breeding practices - Lack of livestock and fisheries policy. - Predominance of foreigners in the fishing industry and reluctance to comply with regulations - Low cold chain development and significant post-capture loss - Insufficient and expensive young fish and quality fish feed - Insufficient quality and quantity of technical support and extension services - Low technical and entrepreneurial skills of most fish farmers - Poor market organisation - Poor development of infrastructure for the production, processing, conservation and marketing of aquaculture products.

OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> - Existence of a sub-directorate for aquaculture. - subsidy and training of farmers - Development of by-products for biogas - partnership with farmers - willingness of stakeholders to invest in the sub-sector - willingness to co-manage in some fisheries - possibility of breeding other endemic species 	<ul style="list-style-type: none"> - endemic diseases (swine fever, avian influenza, etc.) - agro-pastoral conflicts - Inadequate quality control - import of chickens and frozen products - animal theft - input price fluctuations - climate change/drying of watercourses - Unavailability of one day-old chicks - Bush fire - Risk of pollution and environmental degradation in the event of increased fish farming activities

8. CHALLENGES FACED BY THE LIVESTOCK SUB-SECTOR IN THE WEST

The study we have just conducted shows that the livestock, fisheries and animal industries sub-sector has the potential to play an important social, economic and financial role in the West Region. However, it continues to face difficulties, the main ones being: (i) the challenge of spatial planning and food security (ii) improving people's living conditions (iii) land challenge and (iv) difficulty of sustainable management of natural resources.

The government's objective is to change the production and consumption of animal protein in the country. This requires a redevelopment of the regional territory and refers to a division into local entities that are efficient carriers of precise observations.

The challenge of improving people's living conditions is mainly aimed at increasing incomes through improving the income and productivity of invested capital and labour.

In the region and throughout the country, two rules govern access to land: on the one hand, customary rules, and on the other hand, the regulatory texts that are the basis of modern law. Globally, it is the problems related to land use in the region with differences according to localities that dominate this sector of animal production and deserve to be considered in the development of a sustainable spatial planning and management plan.

Natural resource management is also one of the major challenges facing local communities. The increase in production as observed and its intensification can increase the pressure on natural resources. Therefore, it is necessary to organize and encourage producers for a rational and responsible management of these resources. This is more important and complex as it takes place in a context characterized on the one hand by a fast growing population that exerts strong pressure on the said resources, and on the other hand, by recurrent climatic hazards inducing changes in the structure and composition of plant formations and fish species.