SECTOR PROFILE : RICE

The rice value chain in Cameroon is characterized by:

- relative self-sufficiency in the mid-1970s (national production equivalent to 80% of rice consumption in 1975) ;
- a drop in production in the mid-1980s for lack of investment and maintenance of infrastructure during the severe economic crisis ;
- a strong adoption of rice in the dietary habits of the populations due to the rapid urbanization of the country estimated at a synthetic average of 21 kg / person / year, which forges the driving force of the rice market in our country ;
- the potential to cover this strong domestic demand exists, but remains insufficiently exploited ;
- a diversity of ecosystems for the cultivation of rice in (i) irrigated ; (ii) in lowlands ; and (iii) in upland pluvial but insufficiently valued due to the scarcity of resources allocated to the sector and conditions that provide little incentive for the private sector (lack of protection, support for producers, etc.).
- the possibilities of extending irrigated rice cultivation in the traditional basins of the Far North and North West regions with experienced rice companies: SEMRY and UNVDA.
- the poor state of communication infrastructure and the remoteness of the major consumption centers of Douala and Yaoundé.
- the lack of working capital for the acquisition and distribution of inputs to rice growers and the repurchase of their production, often leads to the sale of paddy to neighboring countries and the low price competitiveness of rice delivered to large urban centers.
- recent initiatives to develop rice potential in the southern regions and in particular the Center, the South, the East and the Adamaoua remain poorly coordinated. Their intervention is focused on raising awareness and strengthening the technical capacities of potential rice growers, but with insufficient support in terms of support

for the implementation of developments, the acquisition of land preparation equipment, the fight against pests, post-harvest losses. and processing of paddy rice.

- Despite the improvements observed in recent years, particularly in the perimeters of SEMRY and UNVDA, post-harvest processing and husking capacities to produce quality merchantable rice remain insufficiently developed.

The current potential for the development of irrigated rice cultivation is presented in the table below.

Table n ° 1 : Inventory of rice-growing areas

Production basin	Developed area (Ha)	Exploited Area (Ha)	Potential Area (Ha)	Developed area to enhance	Extension area (Ha)
SEMRY 1 and 2	11,500	10,000	20,000	1,500	8,500
SEMRY 3, PDRI CL	1,500	1,500	1,500	0	0
UNVDA	3,300	1,530	14,000	1,770	10,700
Lagdo	600	600	10,000	0	9,400
SODERIM	200	50	3000	150	2,800
Mount Mbappit	600	300	1,500	300	900
Menchum Valley (PADFA)	65	65	200	0	135
Moulvouday project	600	250	600	350	0
PADFA; Vallee Benoue, Guider, Sittibirilli (ExtNord)	1,608	1,608	2 120	0	512
PLANUT (Logone and Chari)	0	0	9 911	0	9 911

Avangane pilot farm	40	40	60	0	20
Nanga Eboko pilot farm	100	100	100	0	0
Afrifood	30	30	30	0	0
Tonga (PADFA)	50	50	1000	0	950
Total	**20,193**	**16 123**	**64,021**	**4,070**	**43,828**

The potential in rainfed rice cultivation is 30,000 hectares exploited with possible extensions to more than 55,000 hectares.

The production from these perimeters, the demand and the imports of milled rice are presented in Table 2 below.

Table n ° 2 : Consumption needs, national production and deficit in milled rice

Year	IMPORTS		NATIONAL NEEDS (tons)	NATIONAL PRODUCTION (tons)	GAP TO BE FILLED (tons)
	Amount (tons)	Value (FCFA)			
2011	507 338	134 954 651 803	ND	ND	ND
2012	552,472	156 613 237 694	449,175	118,181	330,994
2013	819 841	212 558 180 036	460,642	126,161	334,481
2014	590 975	139 985 598 984	472 334	99,609	372 725
2015	707,247	181 127 064 371	484 230	180 882	303 348
2016	614,400	143 636 370 528	496,370	233,558	262 812
2017	ND	183 726 000 000			
2018	ND	ND	440,000	105,000	335,000

I.2 - Actions to be taken in the short and medium terms to reach or even exceed the production levels corresponding to these national needs ?

In the short term, the priority actions to be carried out will focus on :

- Improving production and post-harvest operations ;
- The pursuit of specific studies to identify and develop new rice-growing areas ;
- The rehabilitation of certain rice-growing areas already in operation (20,000 ha) in the West, North-West, North and Far North regions;
- The acquisition of basic and certified seeds ;
- Completion of the restructuring of SEMRY and UNVDA ;
- The continuation of the development of the potential spaces already available around the rice-growing centers (43,800 ha) ;
- Acquisition of production and post-production equipment and infrastructure ;
- Prospecting for new sites in the Central, Adamaoua and West regions (25,000 ha) ;
- The contractualization of certain services along the chain (soil preparation, cultivation practices, harvesting, drying, shelling, first processing, etc.) ;
- The promotion of the installation of medium and large farmers in the new perimeters and extensions by creating rice development poles according to the model of certain existing agro-industries (contract-farming or agropolis).

Table n ° 3 : Potential production with existing facilities

Years	IRRIGATED RICE				RAIN RICE			
	Double cultivation area	Expected paddy production	Expected production of milled rice	seed requirement in tonnes	surface area suitable for rainfed cultivation	Expected paddy production	Expected production of milled rice	seed requirement
2019	37,086	222,516	144 635	1,298	30,000	75,000	48,750	1,500
2020	56908	341,448	221 941	1,992	35000	87,500	56 875	1,750
2021	71908	431,448	280,441	2,517	40,000	100,000	65,000	2,000
2022	86908	521,448	338,941	3 042	45000	112,500	73,125	2,250
2023	101908	611,448	397,441	3567	50,000	125,000	81,250	2,500
2024	116908	701,448	455,941	4092	55000	137,500	89,375	2,750

Thus, by 2024, Cameroon should be able to meet or even exceed its rice needs.

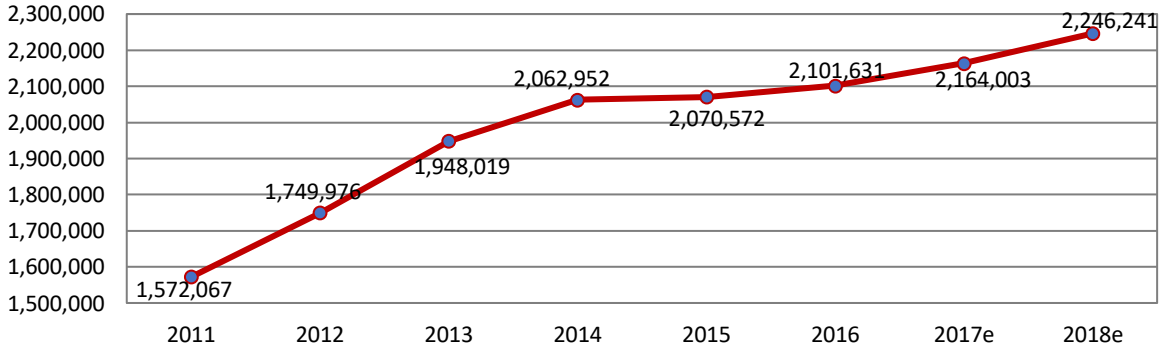
SECTOR PROFILE : MAIZE

Maize is cultivated in all agro-ecological zones of Cameroon and constitutes the staple food of the country's populations. It is also involved in animal feed (poultry, pigs, cattle) in grain, feed or as fodder. It is also used as a raw material in certain industries (agrifood, textile, pharmaceutical, etc.), for the creation of biodegradable plastics, biofuels and even alcohol. Corn is used in the manufacture of beverages, brewing industries and other agrifood industries (Tanty, biscuits, pastry, distillery, etc.).

National production

The evolution of maize production has been steady over the past decade. Indeed, between 2007 and 2014, it evolved as shown in the graph below :

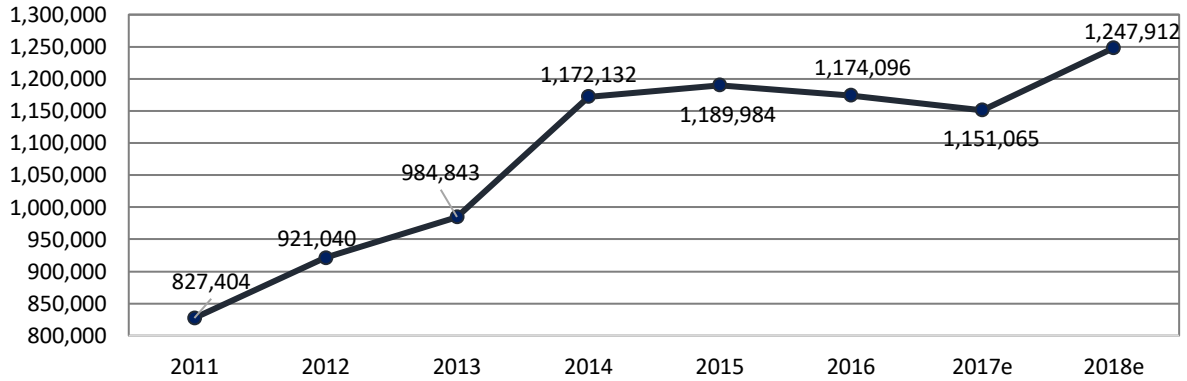
Graph 1 : Evolution of national production between 2011 and 2018 (in tonnes)



Source : MINADER / DESA and FAO STAT.

Maize production was 1,948,019 in 2013 and stands at 2,246,241 tonnes in 2018 according to FAOSTAT. The areas sown by maize production also evolved over the same period from 984,843 ha to 1,151,065 hectares.

Graph 2: Evolution of sown areas between 2011 and 2018



Source : MINADER / DESA and FAO STAT.

Imports

Although Cameroon is a maize producer, the country also imports the cereal through trade with its trading partners. The products concerned are dried corn seed, corn flour and grits.

Maize

Year	Quantity (tons)	Value (FCFA)
2011	6,080	1 469 128 237
2012	17 283	3,634,875,773
2013	10,748	2 358 647 546
2014	33 588	5,314,551,817
2015	9,141	1,667,817,868
2016	31 959	5,518,773,189
2017	45 968	5,801,347,263
2018		

Source : INS.

Within the framework of formal trade, maize imports reached the level of 45,968 tons in 2017 for a value of 5.8 billion FCFA .

Demand

Based on the above assumptions, the potential demand for maize over the period 2019 to 2023 is presented in the table below.

Table 2 : Estimate of potential demand for maize over the period 2019 to 2023 (in tonnes)

Purpose	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Human food	1 180 658	1 209 170	1,238,370	1 268 276	1,298,904	1,330,272	1,362,397
Animal feed	507,054	536,769	618 653	660 364	705 699	755,006	808 677
Poultry feed	349,162	366,694	415,005	439,615	466,362	495,454	527 119
Pig feed	197,046	205,663	229,409	241,506	254 653	268 952	284,516
Aquaculture feed	60 846	64,412	74,238	79,244	84 684	90,601	97,041
Brewing industries	90,994	93 813	98,504	103,429	108,600	114,030	116 311

Purpose	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Seeds	29,527	30,649	32 150	33 726	35,378	37 112	38 930
Losses	432,801	449,248	471,261	494,353	518,576	543,987	570 642
Other transformations	167,269	173,626	182,133	191,058	200 420	210 240	220,542
Other purposes (including exports)	180,035	203 077	217,148	211,418	225,898	220,596	235,526
Potential demand	**2,588,337**	**2,696,351**	**2 858 220**	**2 962 624**	**3,093,475**	**3,211,244**	**3,353,025**

Source : MINADER / DESA and our calculations.

The demand for maize for human consumption in 2019 exceeded ***1 238 370 tonnes*** . However, maize is an input for the production of feed that goes into animal feed. The Ministry of Livestock, Fisheries and Animal Resources provides that, requirements for poultry production, pig and aquaculture are attained **415 005 ,** ***229 409,*** *and* ***74 238 tonnes*** in 2019 ; taking into account the request of the brewing industry and other process industries, losses, seeds, etc., the demand for maize would was **2 858 220** tonnes in 2019. It should be noted that this figure is minimal given the fact that this food is the subject of significant outflows not recorded in official statistics (via informal networks) to neighboring countries.

Estimate of the forecast deficit

The gap in 2018 is 450,110 tonnes. If nothing is done within 5 years, we will reach the 500,000 corn deficit.

Table 3 : Analysis of constraints in the maize sector

No.	Constraints	Causes	Orientations to solutions
1	Low accessibility to improved seeds	▪ Low level of extension ▪ High acquisition cost of seeds.	▪ Make seed production infrastructure available to producers ; ▪ Sensitize producers for the use of improved seeds ;
2	Insufficient basic seeds	▪ Low funding ▪ Parental degeneration ▪ Insufficient number of researchers	▪ Increase IRAD's budget ▪ Renew parents ▪ Recruitment of new researchers and harmonize the retirement age at 65.
3	Weakness in seed quality control	▪ Insufficient number of inspectors and logistical resources	▪ Increase control inspectors ; ▪ Build the capacities of private seed companies
4	Mechanization of insufficient production	▪ Unsuitability of gear to the environment ; ▪ Insufficient gear ▪ Insufficient funding	▪ Change the existing model ▪ Increase the related budget
5	Very atomized production	▪ High cost of equipment ▪ Lack of spare parts	▪ Structuring of producers ;

No.	Constraints	Causes	Orientations to solutions
			▪ Basin approach (creation of specialized agricultural economic zones)
6	Loss in the field and high post harvest (10-30%	▪ Rudimentary preservation techniques ▪ Insufficient conservation and storage equipment	▪ Set up appropriate post-harvest infrastructure in the basins
7	Essentially artisanal processing	▪ High cost and scarcity of processing equipment ; ▪ Lack of technology	▪ Creation of modern transformation units ; ▪ Training of repair workers.
8	Enclosure of production basins	▪ Insufficient evacuation routes ; ▪ Insufficient maintenance of existing roads	▪ Create access roads to production basins ; ▪ Set up maintenance committees
9	Poor organization of producers	▪ Insufficient awareness of producers ; ▪ The reluctance of some producers	▪ Raise awareness among producers ; ▪ Strengthen the structuring of producers ▪ Encourage community activities
10	Difficulties in the flow of production	▪ Lack of a marketing strategy	▪ Promote contract farming at the national level ▪ Practice the " group " sale
11	High cost of fertilizers and pesticides	▪ Lack of local fertilizer manufacturing plants	▪ Subsidize fertilizers ; ▪ Set up a fertilizer factory in Cameroon

No.	Constraints	Causes	Orientations to solutions
		▪ Import of pesticides	
12	Insufficient financial resources	Unsuitability of financial products for agricultural production	Set up innovative financing models (public-private partnership, warrantage, leasing)

Production basins

Table 4 : Distribution of production basins

Production basins	Assets	Limits	Producer category
North - **Mayo rey** - **Bénoué**	- Vast land suitable for mechanization ; - Low post harvest loss - Good drying - Land facility - Available land area : 5,500 ha for irrigated cultivation and 250,000 ha for plowing	-Low yield (<2.5tonnes / / ha -Uncertain rainfall	Large and medium-sized producers
Where is - **Bamboutos** - **Noun** - **Nde**	- Strong concentration of producer resources - Culture tradition - Use of organic fertilizers (droppings) - Better returns	-Difficulties in drying -Land issues -High post harvest losses	Ways

	- Area of land available: - Available area: 150,000 ha in the Nun ; - 354 ha in the Ndé		
Center **- Mbam and Kim** **- Mbam and Inoubou** **- High sanaga**	- Vast land suitable for mechanization - Land facilities - Better returns - Available land area: 64,600 ha in Mbam -Inoubou	-Difficulties in drying -High post harvest losses -Low rotation	Large and medium
Adamoua **- Faro & Deo** **- Vina**	- Vast land suitable for mechanization - Land facilities - Better returns - Area of land available : 50,000-60,000 ha	-Difficulties in drying -High post harvest losses	Large and medium
North West Donga mantum	- Vast land suitable for mechanization - Better returns - Available area: - 4 800ha	-Difficulties in drying -Land issues -High post harvest losses	Ways
Coastline : Mungo	- Vast land suitable for mechanization - Better returns	-Difficulties in drying -High post harvest losses -Prohibitive cost of deforestation	Ways

IS **Kadey**	- Fertile land (rich in iron and aluminum sesquioxides ; - Area of available land (4428.08ha), - Possibilities for the production of other cereals ; - Existence of average producers	-Low use of fertilizers -Difficulties in drying and storage -Post harvest losses noted -Low yield -High cost of stumping	Ways
South West	- Crop diversification (annual and multi-year) - Fertile land (rich in recent volcanic ash) - Better performance - Available area : 3600ha - Existence of average producers	-Low use of fertilizers -Observed post harvest losses -Difficulties in drying and storage -High cost of stumping	Ways

Source : MINADER / DESA and our calculations.

SWOT Analyses

Strengths	Weaknesses
- First cereal cultivated and consumed. - Maize is produced in all agro-ecological zones of the country - Maize can be grown in any season with irrigation. - Existence of many suitable and high yielding varieties - Main source of income for many producers - Cultivated by all age groups (active people) and without distinction in the gender approach. - Strongly contributes to food security (80% of production is self-consumed)	- Low accessibility to improved seeds - High cost of fertilizers and pesticides. - Insufficient mechanization of production. - Very atomized production. - High field and post harvest losses (10 to 30%) - Essentially artisanal processing - Insufficient drying and storage infrastructure. - Lack or lack of funding. - Enclosure of production basins. - Weak organization of producers. - Difficulties in selling to potential buyers.
Opportunities	- Threat
- Existence of a development strategy for the maize sector at MINADER. - Climatic conditions favorable to the cultivation of corn throughout the territory. - Existence of arable and fertile land suitable for growing maize.	- Climatic changes. - Difficulties in accessing land. - Growing insecurity in some regions (Far North, North West and South West) ; - Pest attacks and disease (Fall armyworm).

- Constantly growing demand on the national and sub-regional market. (local consumption, feed mill, breweries, ...) - Existence of state structures capable of supporting the development and mechanization of the sector (MATGENIE and CENEEMA) - Existence of state structures capable of producing seeds in certain regions (SOWEDA and MIDENO) Upward trend in the kilogram of maize	

MAJOR STAKEHOLDERS

- Ministry of Agriculture and Rural Development (MINADER);
- Ministry of Scientific Research and Innovation (MINRESI);
- Ministry of Mines, Industry and Technological Development (MINMIDT);
- Ministry of the Economy, Planning and Regional Development (MINEPAT);
- Ministry of Trade (MINCOMMERCE);
- Agronomic Research Institute for Development (IRAD);
- Interprofessional Association of Seeds and Plants of Cameroon (ACOSEC);
- National Support Program for the Maize Sector (PNAFM);
- Agricultural Competitiveness Improvement Program (PACA);
- Agricultural Investment and Market Development Project (PIDMA);
- Breweries, feed mills, flour mills;

• Local and regional authorities; • Cultivators; • Foreign technical partner for the establishment of the transformation.

SECTOR PROFILE : AQUACULTURE

1. Generalities

Fish is a preferred protein source for most Cameroonians because it is cheap compared with other meats as bush meat, pork, chicken and beef. Prices for fish vary from 700-3,000 francs (FCFA) per kilogram (kg) according to the quality and the place of purchase. Additionally, fish is available in conveniently small units that can be easily purchased by the
poor.

Nationally average fish consumption is estimated at 18.5 kg/ person/ year, this value is higher (30-35Kg) in larger cities like Yaoundé and Douala whereas the WHO recommended standard is 14,5kg/ person/ year. These figures clearly illustrate the increasing demand of the Cameroonian population for fish.

Fish in Cameroon is consumed in several ways: fresh (roasted, fried or cooked), smoked, dried, salted.

Cameroon is endowed with an enriched Ichnofauna where you can find the world's best aquaculture candidates which are compatible to consumers' preference: with kanga (*heterotis niloticus*), cichlids (*hemichromis fasciatus*), viper-fish (*channa obscura*) and catfish (*heterobranchus longifilis*) being indigenous and clariids (*clarias gariepinus*), tilapia, cichlids (*cyprnus carpio*) are introduced species.

The key indicators of this sector can be economical, socio-territorial and environmental.
Economically one can state: productivity of table fish, profitability of the activity, genetic selection etc. Socio-territorially

there are: touristic orientation of the activity, management of expertise, density of the clientele network. Environmentally: productivity of table fish in ponds, management of water resources, conversion ratio in ponds and out of ponds.

The main segments of the value chain are: genitor producers (critical), fingerling producers, table fish producers, sellers (wholesalers/retailers), cool storage, processors and transporters.

National market: aquaculture production (5000tons) constitute less than 10% of the total fish produced (180 000tons). Domestic demand stands at 420 000tons of fish per year. Unfortunately, production has not being able to follow the stand trend obliging government to embark on importation of over 220 000tons of fish which cost over 200billion FCFA. This clearly indicates that investing in aquaculture could be a better option in reducing importations and there is an important market as indicated by the consumption rates of Cameroonians. Despite the insufficient production, Cameroon is still able to export smoked fish and crustaceans to neighbouring landlocked countries.

2. Production

Production season and cycle of fish vary per species and the type of feed. Production of Clarias is generally done during the raining season given that it is their spawning period. But with advances in genetics, spawning is possible off season. It is also the case with the Carp. As for Tilapia, due to their early maturity, they spawn all year round. Production cycle of catfish when feed with floating feed can be between 3 to 5months to reach a market size of 400-500g while that of tilapia could be 5 months.

Anybody can do fish farming but special knowledge is needed especially for genitor, fingerling and feed production. Climate and water quality play a key role in aquaculture development. Cameroon found in the tropics has climatic

conditions that are favorable for aquaculture. Pond aquaculture can be practiced in all the 05 agro-ecological zones but out of pond culture (concrete tanks, plastic tanks etc) is most practicable in the Littoral, Centre and Northern regions. The mean aquaculture productivity is about 400kg/ha/cycle.

3. State of processing/ transformation

Majority of the processors are women. They process the fish via smoking using local traditional ovens. Despite the fact that 06 FAO FTT ovens were installed in Cameroon, only one is functional in the North. The main constraints were: the women were not trained on how to use this recent processing technology and also the FTT ovens were not contextual to the localities in which the ovens were installed. These processors mostly fund their businesses although some are organized into groups (CIGs, cooperatives) which assist them. The smoked fish is also imported to neighbouring countries. There exist noquality control to assess the quality of their produce.

4. Marketing

Prices of fish varies with respect to the species and the state of the fish. Live catfish are sold at 2000-2500FCFA/kg. Smoked catfish sold in heaps varying between 500FCFA to 10 000FCFA. Live tilapia are sold at 1500 to 1800FCFA while smoked ones are sold at 200 to 3000FCFA.

5. General analysis

➢ **Aquatic Potentialities of Cameroon**

- Dense hydrological network with over 4 million ha of inland water bodies;

- 2 700 km2 of mangrove and 15 400 km2 of continental plateau;
- Topographically, it characterized by highlands (Adamawa), lowlands (North Cameroon) and Plateaus (Bamoun, Bambiléké) which are appropriate for pond construction;
- It's characterized by an Equatorial Guinean climate with four seasons, the Southern Cameroonian plateau and a Cameroonian type of climate with two seasons, in the Western Cameroon Highlands;
- It has an enriched Ichnofauna where you can find the world's best aquaculture candidates which are compatible to consumers' preference with kanga (*Heterotis niloticus*), cichlids (*Hemichromis fasciatus*), viper-fish (*Channa obscura*) and catfish (*Heterobranchus longifilis*) being indigenous and clariids (*Clarias gariepinus*), tilapia, cichlids (*Cyprnus carpio*) are introduced species;
- A Favorable Climate and Ecology;
- Existence of training institutions for aquaculture (IRAD, CNFZVH, universities etc).

➢ **Constraints**

- Lack of quality genitors
- High cost of quality fish seeds - fingerlings;
- Lack of a local fish mill unit;
- High cost of imported feeds;
- Lack of special credit schemes to support aqua-business start-ups;
- Low level of structuring of the sector;
- Lack of synergy amongst stakeholders.

Perspectives/recommendations

- Creation of a fish breeding center
- Capacity building of fish farmers on recent production technology;
- A national body is needed to coordinate all stakeholders involved in the sector;
- Update research and extension facilities and strengthen the capacities of their personnel on recent advances in aquaculture;
- Creation of local fish mill units using recent technologies;
- Apply the 2018 financial law on existing tax incentives with respect to importation of agricultural equipment and inputs.

6. Actual needs

- Creation of a breeding center;
- Creation of local fish mill units using recent technologies;
- Apply the 2018 financial law on existing tax incentives with respect to importation of agricultural equipment and inputs;
- Capacity building of fish farmers on best management practices in aquaculture;
- Update research and extension facilities and strengthen the capacities of their personnel on recent advances in aquaculture;
- Facilitate access to loans;
- Reorganization of the sector.

7. Possible actions for the development of the sector and particularly for the stimulation of investments in the value chain

Government through its several institutions are involved one way or the other in the stimulation of aquaculture in Cameroon. These are main institutions and their roles:

- Ministry of Scientific Research And Innovation through her Specialized research stations (Foumban, Limbe, Kribi, Nkolbisson) at the Institute of Agricultural Research for Development (IRAD); they develop new technologies and innovations;
- The ministry of livestock, fisheries and animal industries (MINEPIA) carry out extension services by valorizing the technologies to fish farmers;
- Ministry Of Economy, Planning and Regional Development (MINPAT); for the financing of projects and conventions with some foreign donors;
- Ministry of Higher Education through State and private universities train Technicians, Engineers and Researchers.

Here are some key actions taken by government in the development of aquaculture in Cameroon:

- There is a strong desire to revive the aquaculture sector. It is reflected in the multiplicity of aquaculture projects and programs designed and implemented by the Government through the Ministry of livestock, Fisheries and Animal Industries (MINEPIA) in collaboration with the Ministry of Scientific Research and Innovation (MINRESI-IRAD). To this effect, the most recent on-going project (2016-present) funded by IFAD/Government is the ``Aquaculture Enterpreuneuship Promotion Project`` (P.P.E.A by its French acronym) with objectives to contribute to sustainable

improvement of living conditions and incomes of aquaculture farmers in Cameroon through the promotion of economically profitable and job-creating aquaculture enterprises

- The government's desire to promote commercial aquaculture as a lever for development is aimed to create jobs, move from subsistence to a sustainable and socially responsible commercial aquaculture that can limit imports and the outflow of the country's currency, generate incomes for young people and contribute significantly to food security while reducing imports of fish products. To this effect, the Prime Minister during the last Ministerial cabinet meeting instructed the reducing of fish,
  rice and milk importation by 50% before the end of 2020.