FRESH WATER FISH FARMING SUITABILITY ASSESSMENT - CAMEROUN

DRAFT: INTENSIVE FARMING SYSTEMS SUITABILITY AND "ENTERPRISES AQUACOLES"

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INTRODUCTION

This document complements the Cameroun fish farming suitability assessment, introducing in the analysis georeferenced survey data on enterprise-type aquaculture companies, collected under the scope of the *Recensement Général de l'Agriculture et de l'Elevage* (RGAE) - VOLUME 2: MODULE DE BASE, VOLET ENTREPRISE DU RECENSEMENT GENERAL DE L'AGRICULTURE ET DE L'ELEVAGE - TOME 2 RAPPORT D'ANALYSE 2018-2019(FAO-UN et al., 2022)

Enterprise Aquacoles or Aquaculture companies are defined as economic units, legally autonomous, formalized both in its technical (creation/opening authorization) and fiscal (trade register and taxpayer card) aspects, that might consist of one or more production units and establishments.

Data collection includes:

The survey of aquaculture holdings of the "enterprise" type targets the collection of detailed basic data to characterize fish farming, namely:

- setting up a sampling base for studies and surveys.
- determine its number and spatial distribution.
- characterizing aquaculture enterprises.
- determine production.
- Identify and characterize the production sites and operations of the companies.
- list all aquaculture operations.
- characterize available infrastructural resources by business production system.
- identify the available human and material resources.
- establish a list of aquaculture structures and farms owned.
- identify the main sources of financing for agropastoral and aquaculture operations of companies.
- identify the difficulties encountered by companies.
- species.
- Supply of inputs (fingerlings, availability of a hatchery).
- Aquaculture infrastructure and production capacity.

Food and Agriculture Organization
of the United Nations

1.   GENERAL ANALYSIS

Only 27.5% of "enterprise" type aquaculture operations practice pure aquaculture, 72.5% are in association with other agropastoral activities.
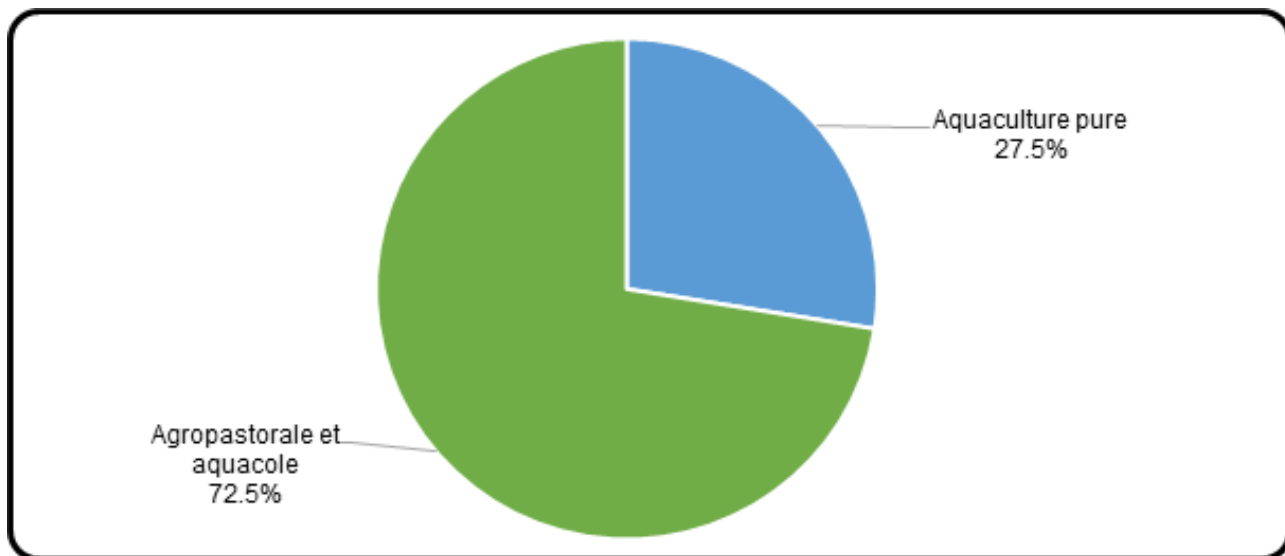

Figure 1 - Enterprise type aquaculture operations (RGAE 2018-19)

Aquaculture farms locate in the southern regions (25 out of 69), 36.2%, and the Littoral (24 out of 69) with 34.7%.

Catfish and tilapia are the most farmed species, Catfish being produced by 92,8% of the enterprises.
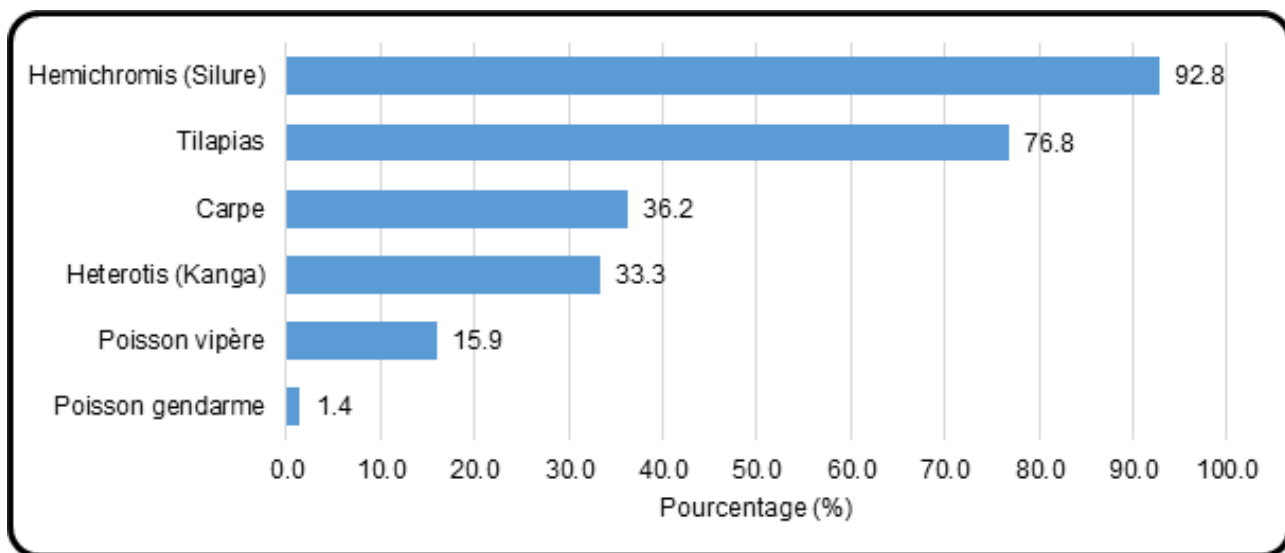

Figure 2 - Enterprise-type aquaculture operations by species (RGAE 2018-19)

Aboveground installations (concrete tanks, plastic, tarpaulin, or fiberglass tanks) are predominant. Concrete tanks are the most used (33 farms out of 69) 47.8%, followed by plastic, tarpaulin, or fiberglass tanks (28 out of 69) 40.6%.

In addition, 78.3% of "enterprise" type aquaculture operations practice aquaculture in earthen ponds (54 out of 69).
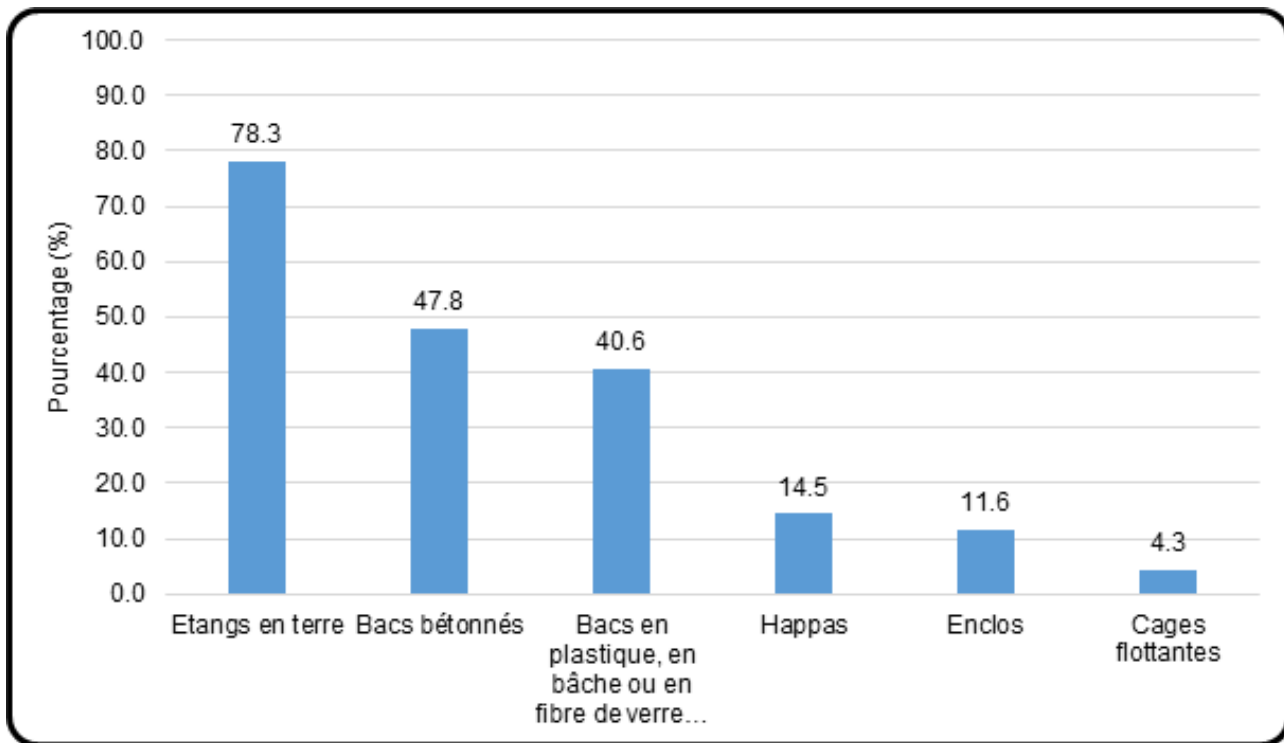

Figure 3 - Enterprise-type aquaculture operations by type of infrastructure (RGAE 2018-19)

A low number of producers (3) reported utilizing floating cages (*Centre*, *Littoral* and *Sud* regions), precise location (survey data) is not available probably due to statistical privacy/confidentiality.

Out of the 69 fish farms 25 have at least one hatchery and most of those are in the Littoral, Centre, and South regions.

Capacity (m3) is also not discriminated by enterprise.

2. MAPPING

Fish farming companies are mapped against a background of an intensive farming system location score to allow the comparison of suitability potential areas and the actual location of fish farming businesses.

Coordinates are missing or wrong for several surveyed enterprise-type fish farming operations. Records were manually georeferenced using visual inspection and attribute fields:

Nom de la Région	Nom du département	Nom de l'arrondissement	Nom Administratif	Autre nom usuel du village

Wrong coordinates:

- ICHINEN FISHING AND FARMING ACCESSORIES
- AGROPASTORAL TRAINING CENTRE SANDPIT

No coordinates:

- GIC PAP-EST
- MBIAME AVIRA RANGE
- INTERGRATED ROCK FARM
- SOCIETE COOPERATIVE BIBOUNGBULU
- ENTREPRISE AGROPASTORALE
- GIC
- COPISUDCAM
- GIC LES PISCICULTEURS INTEGRES "LA REFERENCE"
- LES PLANTATION D'EBEBESSA
- SOC00PROBAM-CA COOP
- COOPCAAIO

Although exact location is not very precise, accuracy is good enough for small-scale mapping analysis.

It must be noted that the coordinates are not of the fish-farming infrastructure (ponds, tanks, cages) but the enterprise, and those can consist of one or more production units and establishments. Georeferenced pinpoint mapped locations do not cover all production sites.

Crossing information from other sources for the year of 2019 adds some doubts. There is no correspondence between companies in the RGAE survey dataset and those cited in the "La FAO appuie le développement de l'élevage de tilapia en cages flottantes au Cameroun" In *FAO Aquaculture Newsletter* (Kinadjian, 2019):

1. CAMFISH in Bambalang
2. CAP FORT in Mbalmayo
3. SIAP in Bagangté

While In RGAE data:

1. CAMFISH Bambalang: No enterprise in Bambalang (*Nord-Ouest)* (Bamendjing reservoir)
2. CAP FORT Mbalmayo: near Mbalmayo in Dizangué one can only find GIC La Moisson.
3. SIAP Bangangté: There are no georeferenced enterprise in Bangangté south of Bafoussam.
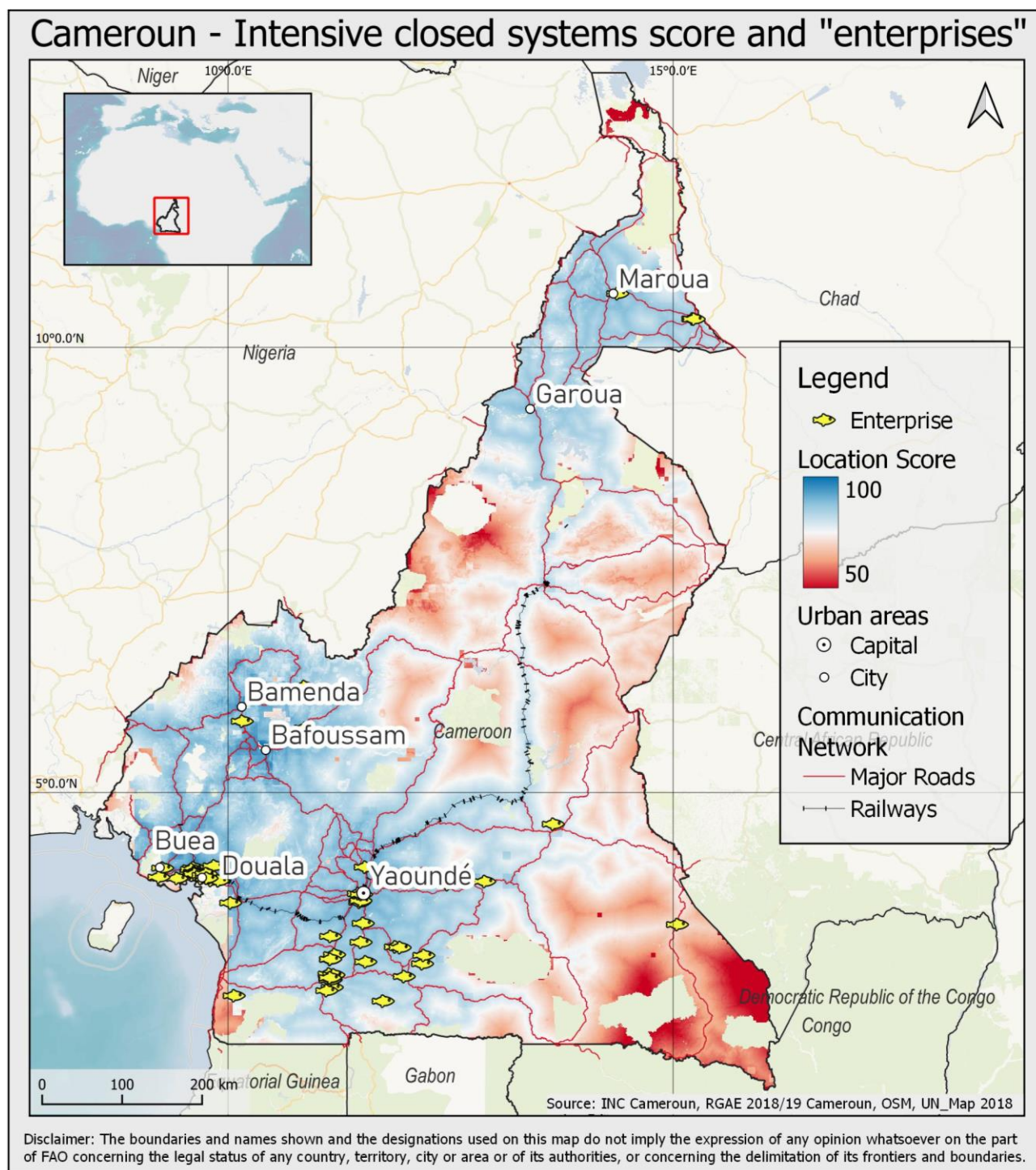
2.1 ENTERPRISES AQUACOLES

Figure 4 – Map intensive systems score and enterprises

Enterprise-type aquaculture operations are essentially clustered around the major urban/metropolitan markets, Douala and Yaoundé (some dispersion to the south), with some more or less isolated exceptions in *Extreme Nord*, *Ouest* and *Est* regions.

High potential areas without enterprise-type fish farming can be found in the *Ouest*, *Nord-Ouest* and *Sud-Ouest* regions, around Bamenda and Bafoussam urban areas, along with Garoua and Maroua urban markets in the *Nord* and *Extreme-Nord.*
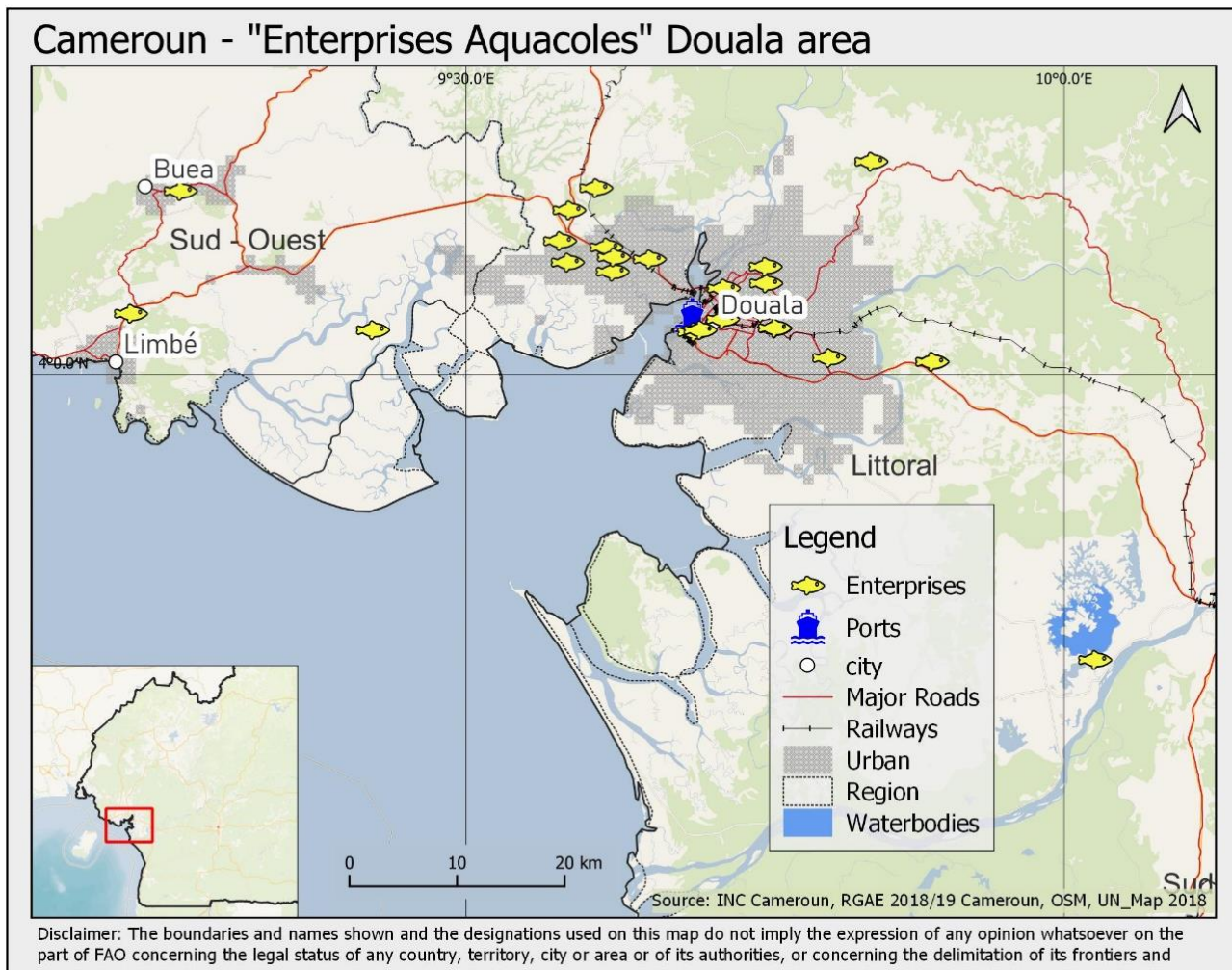

Figure 5 – Map Douala area enterprises

The Douala metropolitan area concentrates close to one third of the fish farming enterprises, with georeferenced companies appearing to be in dense urban areas (>1.500 habitants per square kilometre).
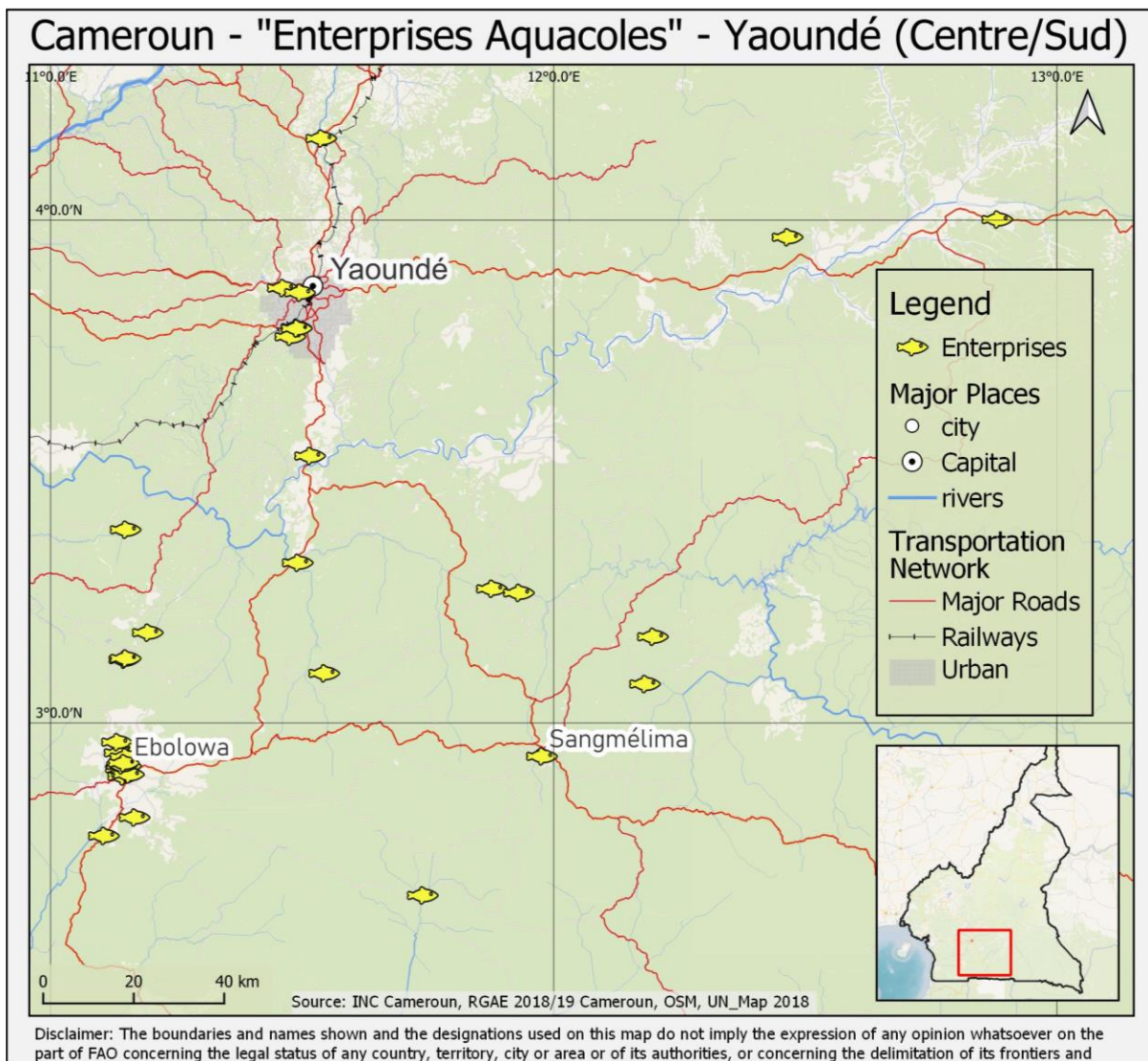
Figure 6 – Map Centre and Sud regions Enterprises

Yaoundé area presents a sparser distribution of enterprises in the *Centre* and *Sud* regions. Although a small market itself, Ebolowa concentrates a large part of the companies in the area.
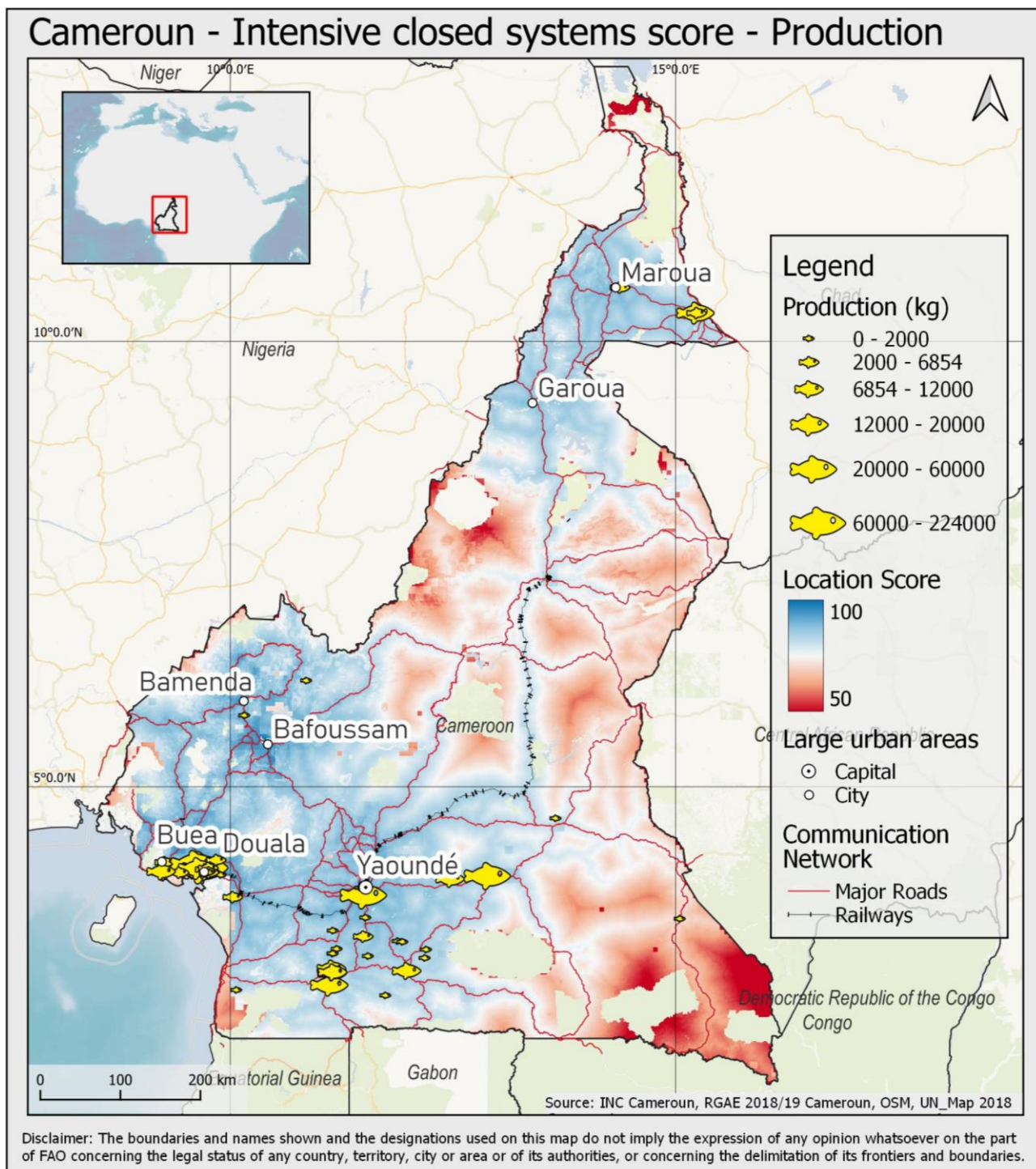
2.2   ENTERPRISES AQUACOLES PRODUCTION

Figure 7 – Map intensive systems score and production

The largest production is centered around Douala and Yaoundé urban areas, very small numbers can be observed in the western regions and, with some exceptions, in most farms outside those peri-urban areas.

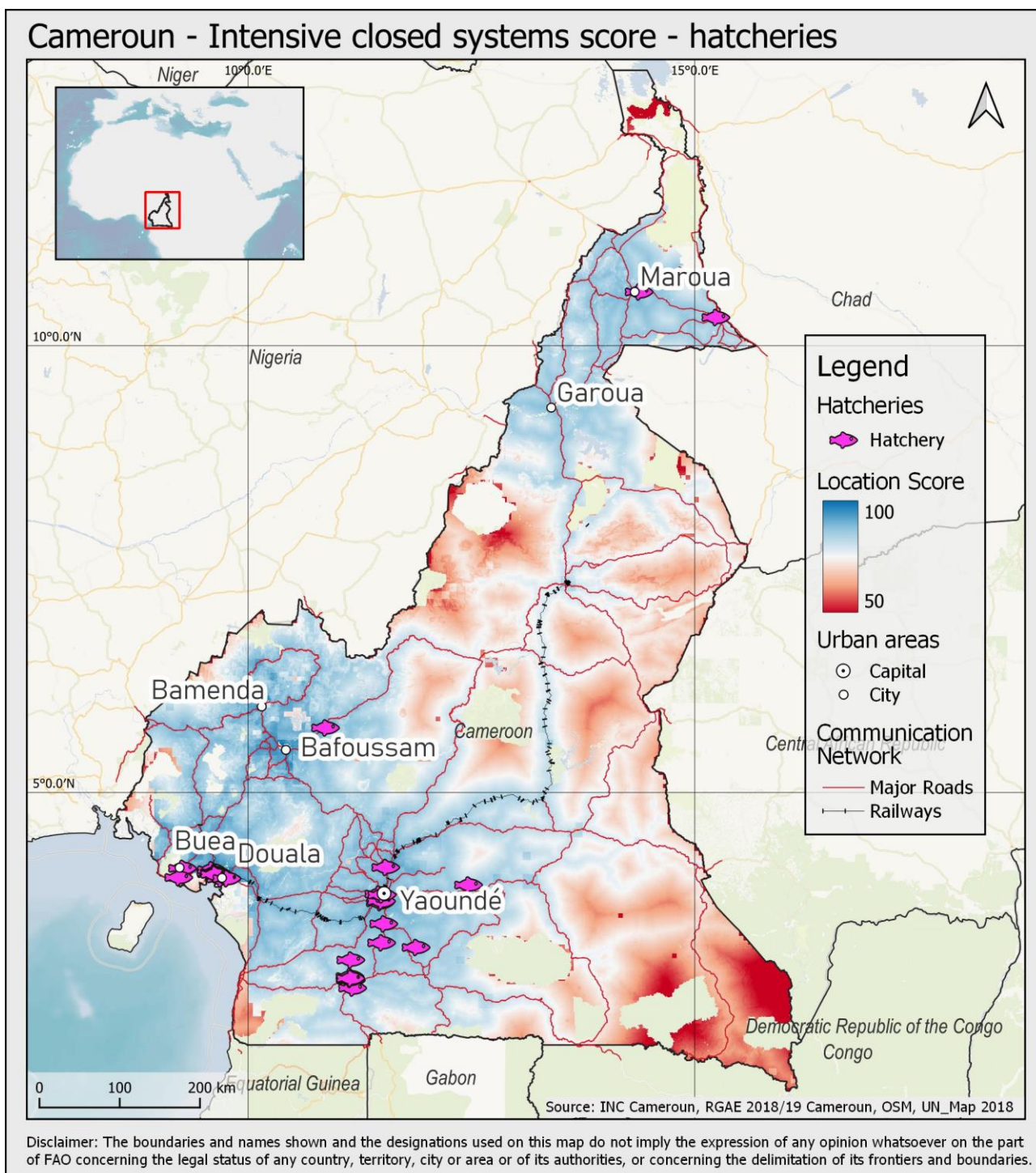## 2.3   *ENTERPRISES AQUACOLES* HATCHERIES

Figure 8 – Map intensive systems score and hatcheries

Douala and Yaoundé show several enterprises producing fish juveniles while northern and western regions seem lacking.
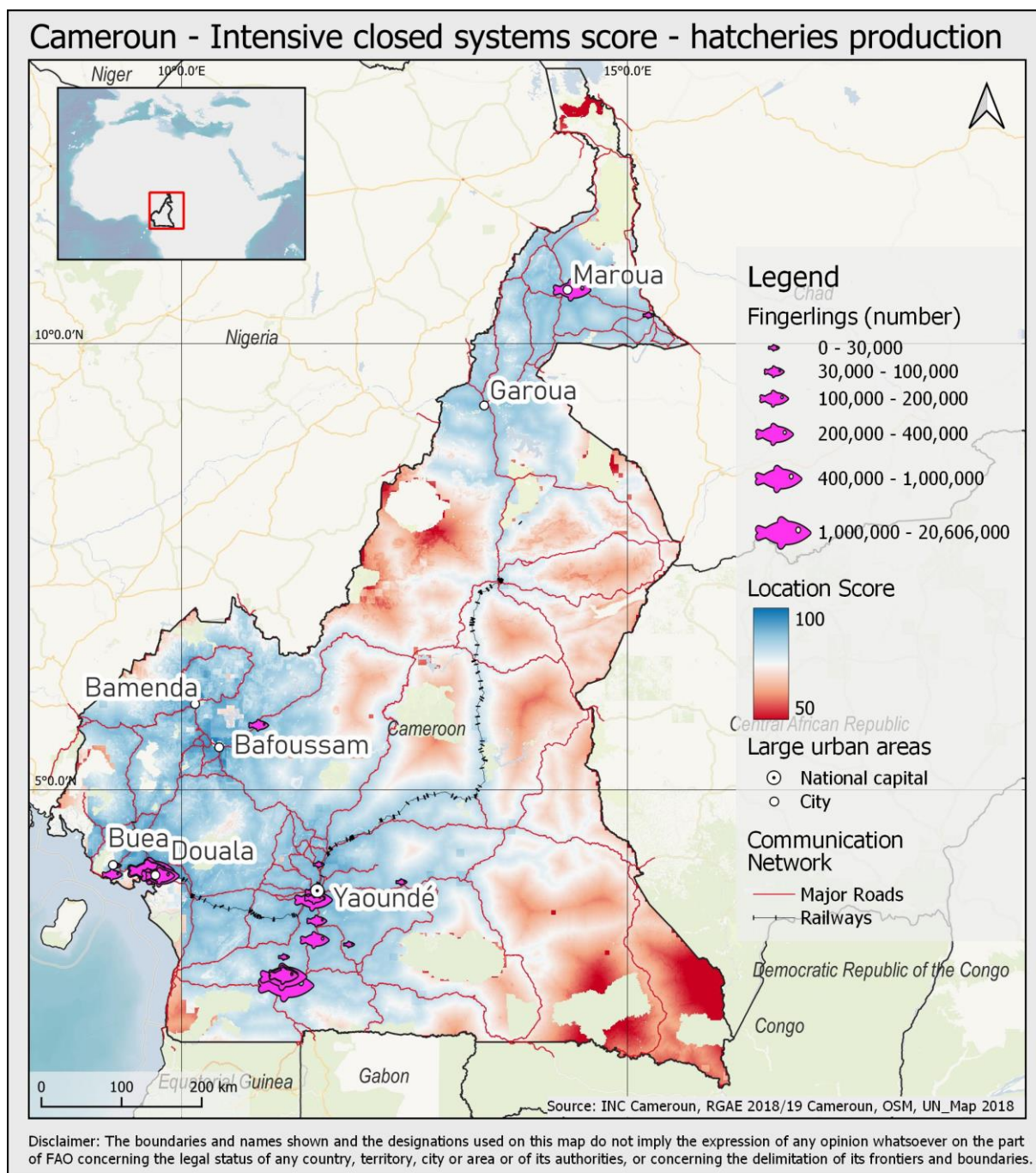
2.4   HATCHERIES PRODUCTION

Figure 9 – Map Intensive systems score hatcheries production

The largest juvenile production appears to be in the *Sud* region Ebolowa, ETS NKOLANDOM FISH, by far the largest in the country, but fish production is very low for the same enterprise (20 606 000 fingerlings but only 1 007 kg fish produced), leading to believe that there might be an error.

Yaoundé and Douala area seem well served, but *Nord* and western regions, where fish farming potential exists, hatcheries are either missing or displaying very low fingerlings numbers.

CONCLUSIONS

Georeferenced survey data, collected under the scope of the *Recensement Général de l'Agriculture et de l'Elevage* (RGAE) covers the formal sector fish farming operations.

Mapping locations (georeferencing) faces different issues, enterprises might consist of different production units, some have wrong or missing coordinates, data doesn't match other sources for companies operating, and some values do not appear to be trustworthy.

One third of the Enterprises exclusively practice aquaculture, with most farms established in southern and littoral regions, gravitating around Yaoundé and Douala urban areas.

Catfish and Tilapia are the most farmed species, predominantly using ponds and concrete tanks, very few enterprises utilizing cages.

Northern (Garoua and Maroua urban areas) and western (Bamenda, Bafoussam urban areas) regions show strong fish farming suitability, potential, but have a very low number of enterprises and a small fish production.

Most of the large fish producers concentrate in urban or peri-urban large markets. Production in Douala is especially concentrated in dense urban fabric, in Yaoundé and south, a less dense pattern is observed. Ebolowa concentrates several farms with medium-sized production even though a small market itself. Western farms and most of the small, scattered enterprises operating in *Centre* and *Sud* show very low fish production values.

Fingerling production is not present in large parts of the country, concentrating in the Douala and Yaoundé urban areas, again with *Sud* and particularly Ebolowa being an exception. Western and northern regions seem clearly underserved.

Overall, based on the modelled suitability and local data made available, western, and northern regions seem to have strong potential for intensive commercial fish farming but low presence of enterprises and hatcheries. Two production clusters can be identified: Douala urban region and Yaoundé in *Centre*. In centre *Centre /Sud* a distinct pattern can be observed, a sparser distribution, with considerable production in areas that do not appear to represent large markets.

Data issues must be considered, the survey focus on formal enterprises operating, some areas could have a higher degree of informality, and some of the data issues/problems identified might question data quality and thus reliability.

BIBLIOGRAPHY

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