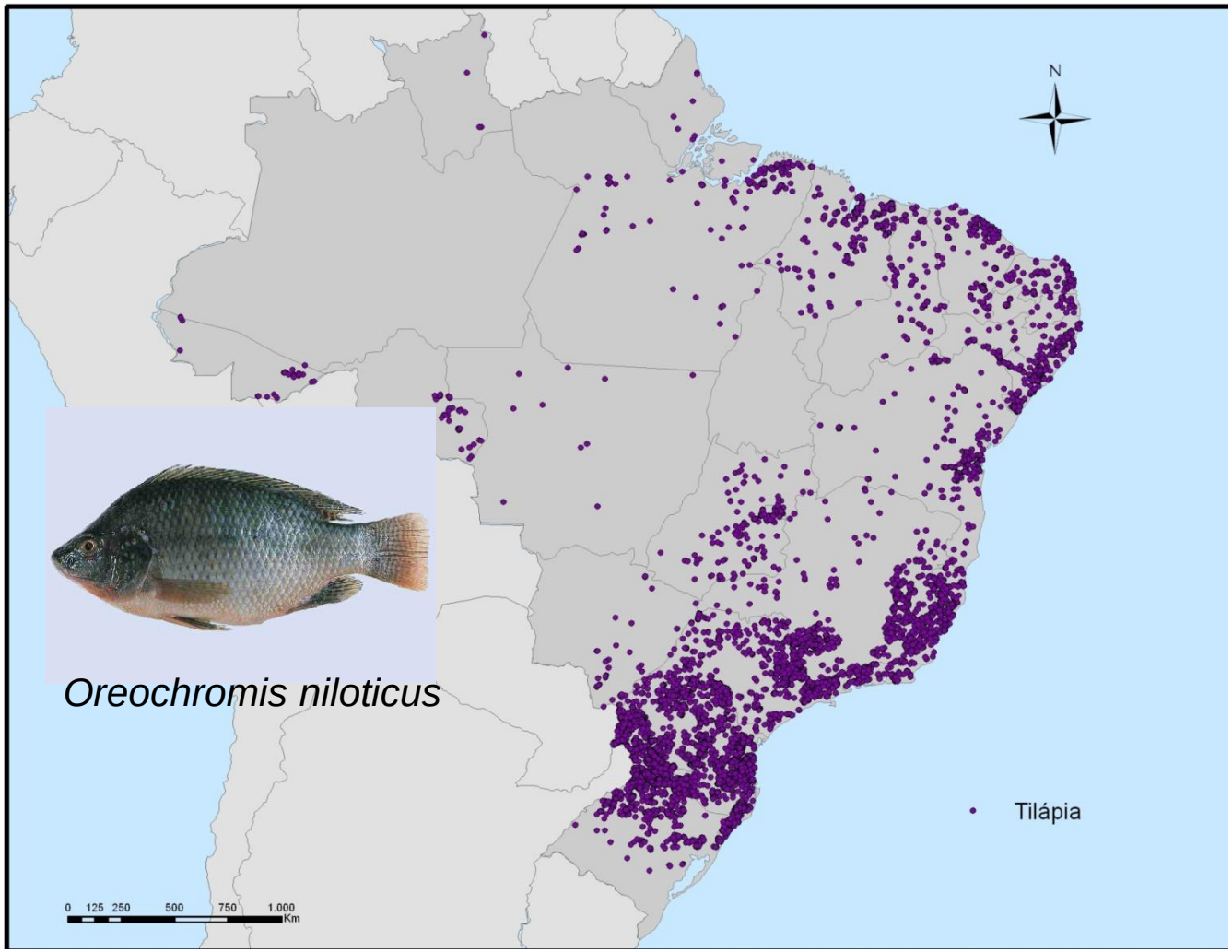
Spatial distribution of the tilapia aquaculture units

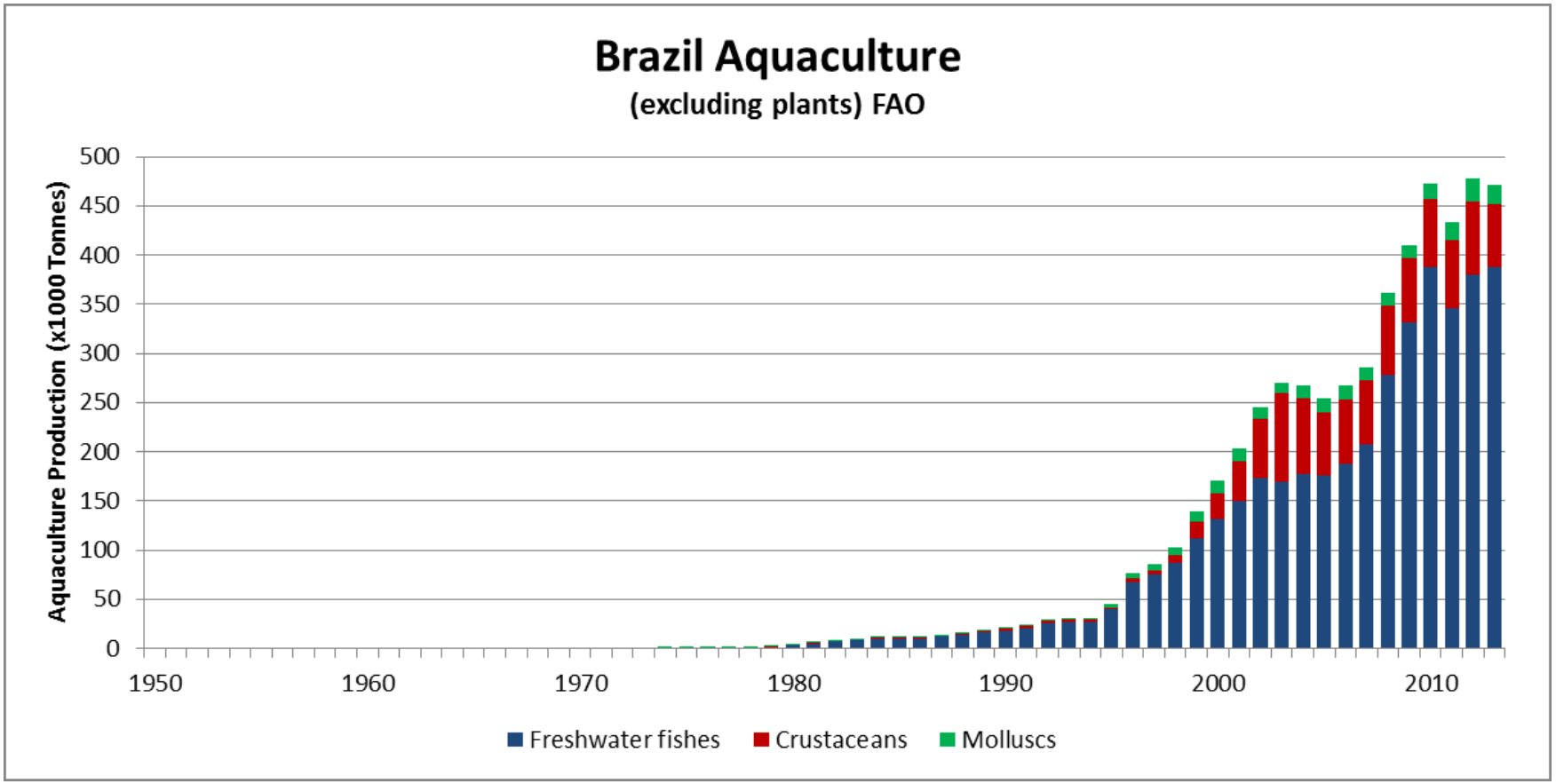


Oreochromis niloticus

Tilapia is the most farmed species in Brazil with approximately **11,000** units

Production in 2016:

250,000 t (~49%)


Brazil Aquaculture
(excluding plants) FAO
Aquaculture Production (x1000 Tonnes)
500
450
400
350
300
250
200
150
100
50
0
1950
1960
1970
1980
1990
2000
2010
Freshwater fishes
Crustaceans
Molluscs

National Action Plan - TiLV

Farmed and wild population of tilapia

Production statistics

Farm Registry

Import/Export data

Diagnostics

Already implemented at federal level (RT-PCR and qPCR). Needs for inter-laboratorial validations

Histopathology and virology available.

Lack of international reference laboratories

Surveillance design and implementation - TiLV

1- Definition objective/purpose of surveillance

Level of certification – Freedom of disease

2- Definition of the population.

- population of interest. Nile tilapia and its hybrids

- target population

- Study population:
  Grow-out farms (ponds, floating cages and others), sampling
  Hatcheries: active surveillance by a specific program.
  Time frame: two years of surveillance, four sampling times

3 – Clustering of disease: not considered

4- Case definition

Case/outbreak definition: clinical signs, qPCR positive, histopathology

Surveillance design and implementation - TiLV

4- Case definition

Case/outbreak definition: clinical signs, qPCR positive (suspected), followed by RT-PCR. Histopathology will be analyzed for all confirmed cases for more information.

5- Sampling

Epidemiological unit: farm or group of adjacent floating cages premises using the same branch of public water

Time frame: two years of surveillance, four sampling times. For hatcheries, 90 days intervals

Sample size for farm units: expect prev: 2%, test (90% sens, 100% esp), 95% conf. interval

Intra-farm sample size: expect prev: 10%, test (S 90%, E 100%), 95% conf.

Surveillance design and implementation - TiLV

5- Sampling

Tissue collection: 95% alcohol, 10% formalin.

6- Diagnostic/testing: RT-PCR, qPCR, histopathology

7: Study design and data analysis:

Survey already described

Risk assessment not available

8- Data flow and management:

- Use of specific form, in digital or printed version, with upload to the PGA (platform od Animal Management)

9- Validation: Pilot trial and expert consulting

10 – Quality assurance: Audit procedure after de first and second round of sampling

11- Human and financial requirements:

- Cost of the surveillance evaluated by cost-effectiveness

- Training program for inspectors, communication staff, stakeholders

12- Surveillance in bigger picture

Emergency preparedness

EPRS audit: still to be done. PVS tools inputs available

TiLV outbreak investigation:

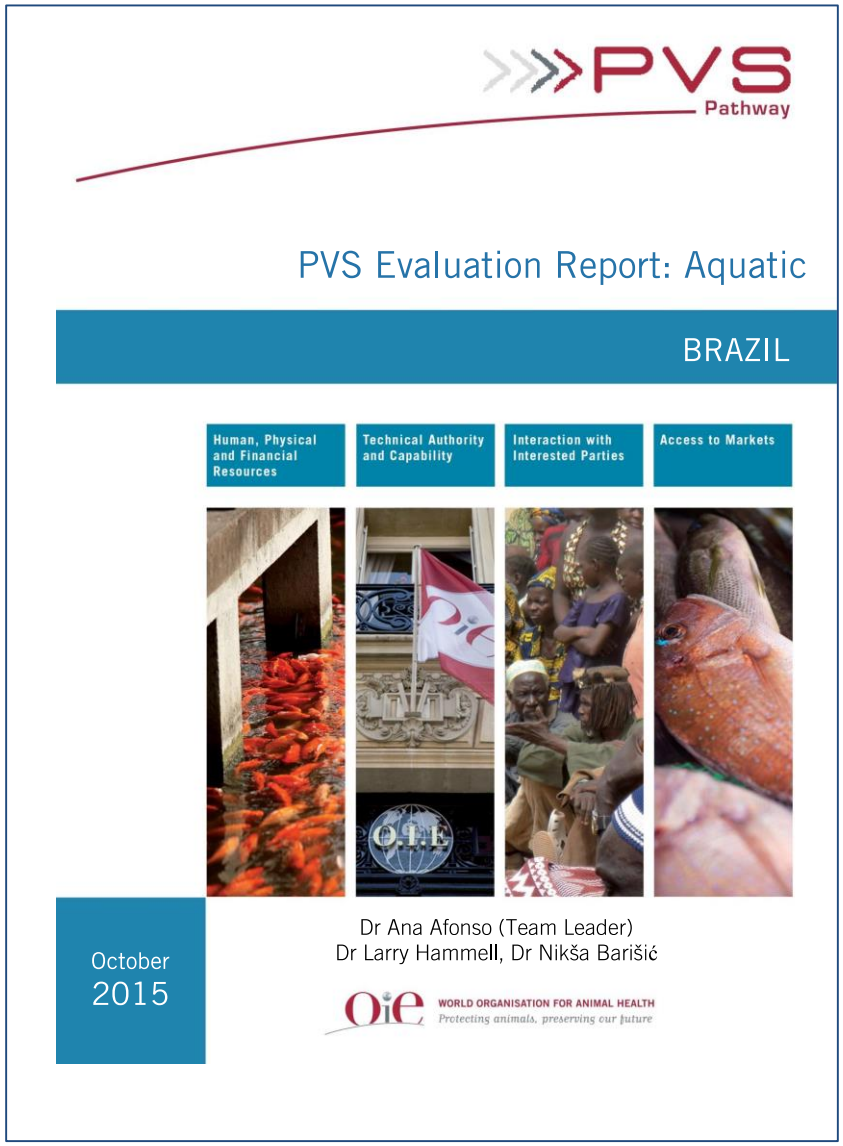
Parameters of passive surveillance are established, but there are limitations in the budget and training

TiLV management and control:

International quarentine already implemented
Farm-level biosecutity: new regulation in Brazil since Sept 2017. The robustness was not evaluated yet.
Records of movement of live tilapia are already implemented and a data base is available

General administration	S: Adequate, clear roles, structure etc.
	W: NEPRS not fully implemented
Communications	S: Good communication with private sector, alert system for marine biotoxins
	W: Lack of a CPLAN
Risk Analysis	S: well implemented and in compliance to OIE regulations, including transparency and commun.
	W: more use of external reviewers
Operational capability	S: Good federal control
	W: heterogeneity in the organization and preparedness at State-level.
Contingency plans	Lack in 2015
Personal skills	At federal level, yes. Weak at state-level
Resource allocation	The strategy plan of CA is not clear for AHH
Legislation	Broad regulations well established, lack of specific SOPs for emergencies in AHH.
Systems review and improv.	Not regularly for AHH

Brazil – Early preparedness and response system



FAO TCP/INT/3501: SUMMARY AND ANALYSIS OF SURVEY RETURNS ON EMERGENCY PREPAREDNESS AND RESPONSE SYSTEM (EPRS)

Early warning system	
Intelligence gathering	Well implemented and supported by AHHS
International reporting	Very well evaluated for AHH
	W: Lack of a CPLAN
Trading partner networks	W: scarce commun. Few markets for exportation
Early Detection System	
Personal competencies	Good at central level/ poor compet. in AHH at state level
Stand. Operational procedures	Weakly characterized
Awareness building	Active for federal and State servants. Absent for private sector.
National information sharing networks	Regular. Needs for improvement.
Surveillance systems	Passive surveillance irregular in the country, some active surveillance programs (see ahead)
Disease reporting	Aware to OIE requirements. Regulation and competencies well established

Early warning system	
Rapid diagnostic capability	Central lab well structured, with specialists in AHH, SOPs implemented, for OIE-listed diseases and some endemic of country interest. Poor lab capability in many states.
Early Response System	
Personal competencies	Good at central level/ poor competencies in AHHP at state level
Awareness building/training	Absent
SOPs	Absent
Contingency plan documents	General framework developed. Adaptation to TiLV been elaborated
Operat. Support Systems	
Legislation	Well established
Information management systems	Yes, but poor documented
Resources	Expertise, yes. No funds for compensation

The following are the on-going or to-be-implemented programs:

- National Program for Monitoring of Tilapia Fingerlings Plan for Monitoring Juvenile Aquatic Animals
- National Program of Sanitary Control of Fisheries Vessels and Landing Infrastructure
- National Program for Hygienic and Sanitary Control of Bivalve Molluscs (being implemented in the state of Santa Catarina)
- National Program for Monitoring of Antibiotic Resistance in Fish
- National Program for Aquatic Animal Health