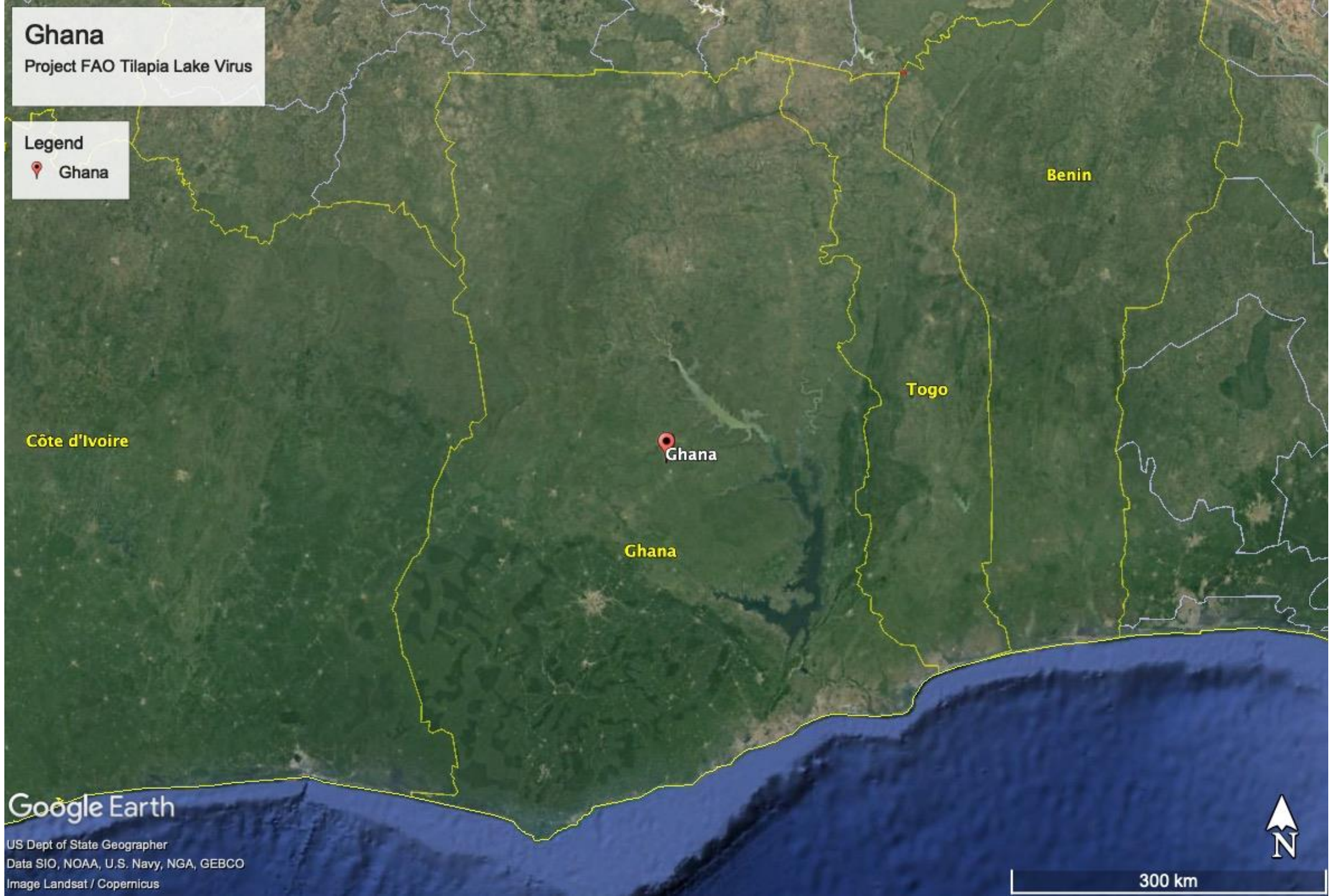
NATIONAL ACTION PLAN FOR ACTIVE TILAPIA LAKE VIRUS (TiLV) SURVEILLANCE IN GHANA

Checklist #	Requirements/Considerations	Considerations
1. Aims/Purpose of surveillance program	Scenario 3: Unexplained fish mortalities The purpose is to conduct surveillance activities to ascertain the presence/absence of TiLV in farmed Nile tilapia (*Oreochromis niloticus*) in Ghana.	
2. **Definition of population: pond, farm, location, region**	1. Nile tilapia (*O. niloticus*) is the target species. 2. There are about 2,300 fish farms comprising cages, ponds and hatcheries from semi-intensive to intensive level of management. 3. The bulk of tilapia is farmed intensively in cages on the Volta Lake located in the Eastern, Volta and Greater Accra Regions. These are the high risk areas for TiLV, where fish mortalities do occur. 4. This program will focus on cages, ponds and hatcheries located on the Volta Lake and its surrounding areas in these three regions. The statistics is as shown below.	

Region	Cage	Pond	Hatcheries	Total
Eastern	87	133	6	226
Volta	118	29	11	158
Greater Accra	73	40	17	130
Total	278	202	34	514


Ghana
Project FAO Tilapia Lake Virus
Legend
Ghana
Benin
Togo
Côte d'Ivoire
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Ghana
Google Earth
US Dept of State Geographer
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
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300 km

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3. **Clustering of disease**	Water temperature of the Volta system ranges from 22 34^{o}C. Fish farming occurs throughout the year with some farms doing two production cycles in the year. Some producers stagger their production to harvest fish every month in a year.	

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4. Case definition	Suspicion: A tilapia farming system in which the farmer has observed during the previous and ongoing production cycle - sudden mortalities and and /or clinical signs such as skin redness/erosions or eyes protrusion/ruptured/cloudiness or abdomen swollen or scale protrusion/loss attributable to the presence of TiLV (e.g. farmer answer “yes”” to the question whether TiLV occurred or not in the farm of interest)	Confirmation: Upon the collection of 30 moribund or sick fish samples, TiLV is confirmed by a positive test result using PCR and the histopathological signs of TiLV

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5. Sampling	1. The Nile tilapia samples will be taken from cages, ponds and hatcheries. 2. Forty (40) farms will be sampled. 3. The systems will include twenty (20) cage farms, fifteen (15) pond farms and five (5) hatcheries. The number of farms/system/ region will be calculated based on percentage from existing data (#2).	**Field survey materials** 1. There will be 6 sections in one field questionnaire form (**hatchery, grow-out ponds and cages**) from FAO. 2. National sensitization about the project and biosecurity issues for farmers 3. Selection of farms for the testing 4. Select 2 teams of 4 members each for Field and Lab work 5. Train the team members and 20 fisheries extension and veterinary officers 6. Conduct field data collection and lab diagnosis 7. Socio-economic survey (the value chain) using questionnaire from FAO	**Laboratory requirements** 1. Use the VSD Lab for Level II 2. University of Ghana Laboratory will be used for Level III diagnosis 3. Water samples will be analysed at the Water Research Institute. 4. Procedure for sending samples to the laboratories will follow FAO SOP. 5. Laboratory form for each laboratory test: Level II and Level III developed by FAO will be used.

Checklist #s 6-7

Checklist #	Requirements	Considerations	
6. Diagnostic testing	SoPs for Level I SoPs for Level II SoPs for Level III Diagnostic team Diagnostic laboratory Materials	Days 1-3 Training course Days 1-3 Training course Days 1-3 Training course	Cross reference to Checklist No. 5

Checklist #	Requirements	
7. Methodology	Invitation letter to participate and enroll farms will be sent out • Epidemiological unit: A tilapia farm • Unit of sampling: A mix of **30 moribund or sick tilapia** from ponds/cages/hatchery at the farm. • Total number of enrolled and participant farms: **40 tilapia farms**; which will be visited twice a year in from March to May and Sep-Nov 2019 (total field visits = 80, at least 1+ve farm, at 2% Prev).	
	Estimated goal for monthly field visits: approx**. 3 tilapia farms per week (range of 2 to 4 farms)** • Timeframe of sampling: 8 months, starting in March 2019. • Sampling proportional for the 3 regions; only aquaculture settings. Predominant tilapia species • e.g., 20 cages, 15 grow-out ponds and 20 hatcheries will be used for the surveillance.	
	• The socio-economic component will be conducted alongside the field data collection to minimize cost. Visits will also be made to the market centres during the survey. The target groupnwill be producers, processors and traders with emphasis on women.	

Sampling proportional for the 3 Regions

Region	Cage	Pond	Hatchery	Total
Eastern	6	10	1	17
Volta	9	2	1	12
Greater Accra	5	3	3	11
Total	20	15	5	40

Checklist #	Requirements	
8. Data management	Database development (Excel) Data management: • Storage • Retrieval • Analysis • Interpretation • Risk communication	Template to be provided for all forms (Checklist no. 5) Classical epidemiological approach: quantify risk factors: other components contributing to the disease development (refer to Snieszko circle) Fill up 2 by 2 table: Contingency table Computation of risk factors (exposed vs non-exposed) Compute: incidence (exposed); Incidence (unexposed) and relative risk
9. Validation	Done by statistical estimation of the level of confidence (not for this project) – Se of surveillance program Done by pilot trial (yes) Done by expert/external evaluation (peer review): Yes	95% confidence is for international sensitivity of the system

Checklist # 10-12

Checklist #	Requirements	
10. Quality assurance	To be discussed	
11: Human and financial requirement	To be discussed	
12. Surveillance in the big picture	To be discussed	

Checklist # 11 Human and Financial Requirement

Activity	No. of items/persons	Unit cost/item /person (USD)	Total cost (USD)
Awareness meetings for farmers	3 meetings for 40 farmers	5,000	15,000
Field Data collection / socio-economic survey	80 visits for a team of 4 persons	300	24,000
Laboratory test (Level II)	10 samples/farm/visit = 800	10	8,000
Laboratory test (Level III)	10*80 = 800	30	24,000
Small equipment	Pocket PCR	1,500	1,500
Diagnostic Team + 10 Vet. officers	2-day training		5000
Surveillance Team +10 Fisheries officers	2-day training		5,000
Other miscellaneous expenses			5,850
Total Cost			**64,350.00**

Costs of Fixatives (ethanol, formalin), disinfectants, field gears, tissues, fish samples, stationery etc will be borne by the Fisheries Commission of Ghana.

Work plan

Activities	Jan 2019	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Jan 2020	Feb
Preparatory work														
Sensitization of farmers														
Training of Teams														
Pilot test and sampling map														
Field sampling and Lab analysis														
Meeting farmers														
Data entry														
Report submission														

Culture period is all year round. High water temperature occurs between February-May and September-November. Sampling for TiLV will be done from March-May and Sep-Nov, 2019.