Food and Agriculture Organization of the United Nations

FIAA Technical Assistance to FAO Member States Re: Response Actions to Aquatic Disease Emergencies

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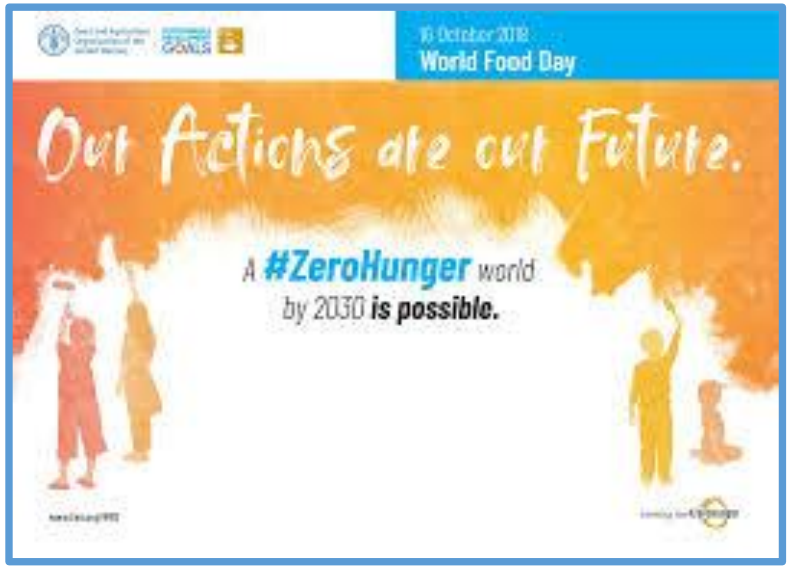
About FAO

- specialized agency of the United Nations that leads international efforts to defeat hunger
- our goal is to achieve food security for all and make sure that people have regular access to enough high-quality food to lead active, healthy lives.
- with over 194 member states, FAO works in over 130 countries worldwide.
- we believe that everyone can play a part in ending hunger.



Department of Fisheries and Aquaculture

Aquaculture Branch (FIAA) one of 6	# of staff
Aquaculture governance (policy, economics, etc.)	4
Aquaculture feed	1
Aquaculture genetics	1
Aquaculture biosecurity (including AMR)	1
Aquaculture technology	2 + 1
Information and communication	1

Possibility of Aquaculture Branch expanding???

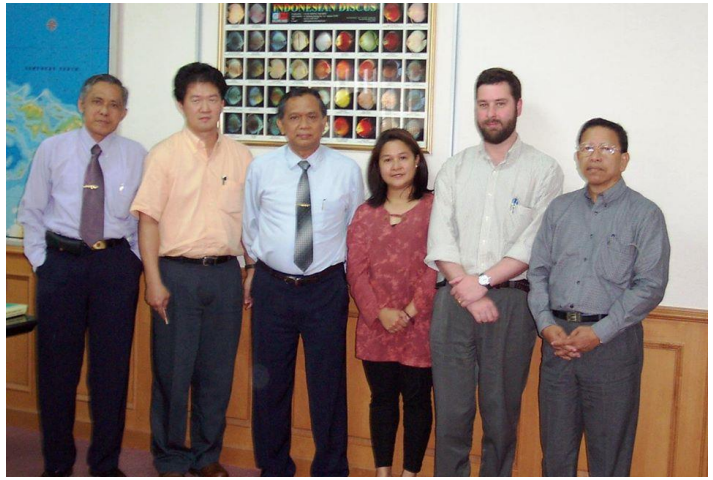
Aquaculture Biosecurity Partnership Programme

Technical assistance, capacity building
Develop projects (TCPs, extrabudgetary funds), secure funding and implement
Develop technical guidelines within the framework of the FAO Code of Conduct for Responsible Fisheries (CCRF)

Outline

Case 1: Indonesia: KHV
Case 2: Botswana: EUS
Case 3: Vietnam: Unknown disease of shrimp
Case 4: Interregional technical assistance on AHPND
Case 5: TiLV in African countries
Lessons learned
FAO mechanisms in place for early warning

Case 1: Indonesia: Koi herpesvirus



Dodet B, the OIE Scientific & Technical Department (eds): The OIE Global Conference on Aquatic Animal Health. Dev Biol (Basel). Basel, Karger, 2007, vol 129, pp 21-28.

Managing the Koi Herpesvirus Disease Outbreak in Indonesia and the Lessons Learned

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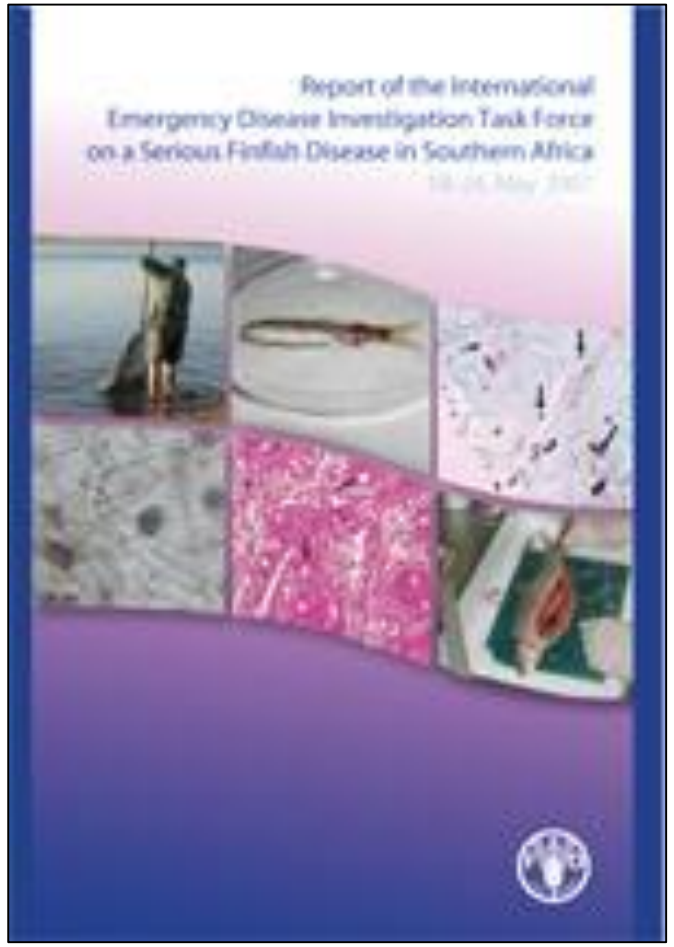
Key words: akoi herpesvirus (KHV), Indonesia, outbreak, epizootic

- NACA KHV International Task Force (S Kanchanakan, A Cameron): 2002
- FAO TCP/INS/2905 (USD 325 000): Health management in freshwater aquaculture in Indonesia: case definition, confirmation of KHV, detailed epidemiological survey (extent of spread) and diagnostics of subsequent outbreaks, support to National Virology Unit (staff training and equipping of laboratory)
- Regional Workshop on Emergency Preparedness
- Losses:
  - March 2002 outbreak: USD 0.5M
  - July 2002 outbreak: USD 5M
  - Dec 2002/2003 oubtreaks: USD 10M/USD 15M
  - Nov 2004 oubreaks: USD 25M

Case 2: EUS: Botswana



http://www.fao.org/3/i0778e/i0778e08.pdf

- Emergency Investigation Team (USD 25 000)
- Confirmed EUS
- Recommended immediate reporting to OIE
- Public awareness campaign
- Initiate short-term training
- Surveillance and more detailed epidemiological studies
- Initiate dialogue among countries sharing the Chobe-Zambezi river
- + 20 more species susceptible
- Tilapia seems to be resistant to EUS ….. carrier!

Case 2.1: EUS: Democratic Republic of Congo: 2015

Find money!

<u>Deployment of an emergency investigation team</u>

(1) confirm that an outbreak was happening; establish a case definition and presumptive diagnosis of the causative agent; (2) collect and process fish samples for relevant laboratory tests; (3) identify risk factors, confirm diagnosis and define further investigation or follow-up work; (4) recommend border/cross border control measures to prevent further spread of the disease; (5) identify specific short-term and medium-term biosecurity action plans that the government may undertake; and (6) provide further recommendations to FAO on how to prevent the further spread of the disease.

https://reliefweb.int/sites/reliefweb.int/files/resources/84AB5A019C558DAE852575FB006E9C09-Full_Report.pdf

FAO GLOBAL INFORMATION AND EARLY WARNING SYSTEM ON FOOD AND AGRICULTURE

SPECIAL ALERT

No. 327

REGION: SOUTHERN AFRICA DATE: 17 July 2009

A fish disease threatens the livelihoods and food security of millions who depend on fisheries from the Zambezi River Valley

Millions of people inhabiting the Zambezi River Valley and depending on fishery resources are at risk of losing their livelihoods and important source of protein due to the outbreak of a fish disease called Epizootic Ulcerative Syndrome (EUS) 1/. The disease is caused by the fungus *Aphanomyces invadans*; it forms ugly lesions on the fish, which makes it unappealing for consumers (see Figure 1). Although the EUS-infected fish do not pose human health hazards for consumers, it is not recommended for human consumption unless proper precautions are taken 2/.

Figure 1: Fish showing EUS lesions from Caprivi Region of Zambezi River (courtesy Dr. B. Van der Waal)

Case 3: EUS: Botswana

- TCP/RAF/3111: Emergency assistance to combat EUS in the Chobe-Zambezi River (Angola, Botswana, Malawi, Mozambique, Namibia, Zambia and Zimbabwe): 2007-2009
- Training on basic AAH management, EUS, risk analysis and surveillance
- Univ of Zambia as regional reference laboratory on EUS: equipped the laboratory and trained staff at OIE EUS Reference Laboratory in Bangkok

Case 3: Unknown shrimp disease: Vietnam EMS/AHPND

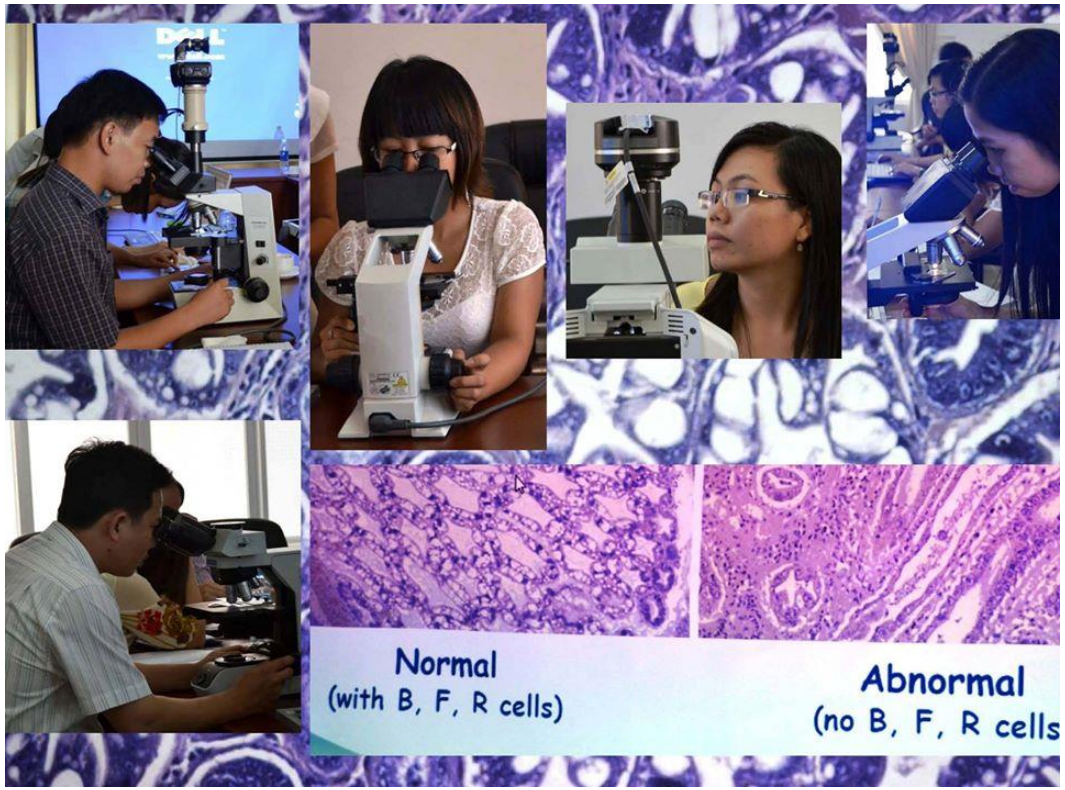
- Request from Government of Vietnam (MARD): a Rapid Deployment Team (RDP), fielded by FAO in July 2011, through the Crisis Management Centre – Animal Health (CMC-AH), made a quick assessment of this unknown disease affecting cultured shrimps in the Mekong Delta provinces of Viet Nam.
- The findings based on epidemiological observations and other relevant field data, confirmed that an outbreak occurred (since early 2010 and continued in 2011) with high mortalities among tiger black shrimp (*P. monodon*) and white-leg shrimp (*P. vannamei*).
- TCP/VIE/3304 (USD 0.5M; 2012-2013): “Emergency assistance to control the spread of an unknown disease affecting shrimps in Viet Nam”

Experts: Dr Don Lighter, Prof. Tim Flegel, Prof. Claude Boyd, Prof Iddya Karunasagar, Prof. M Shariff. Dr R Subasinghe, Dr Visanu, Loc Tran

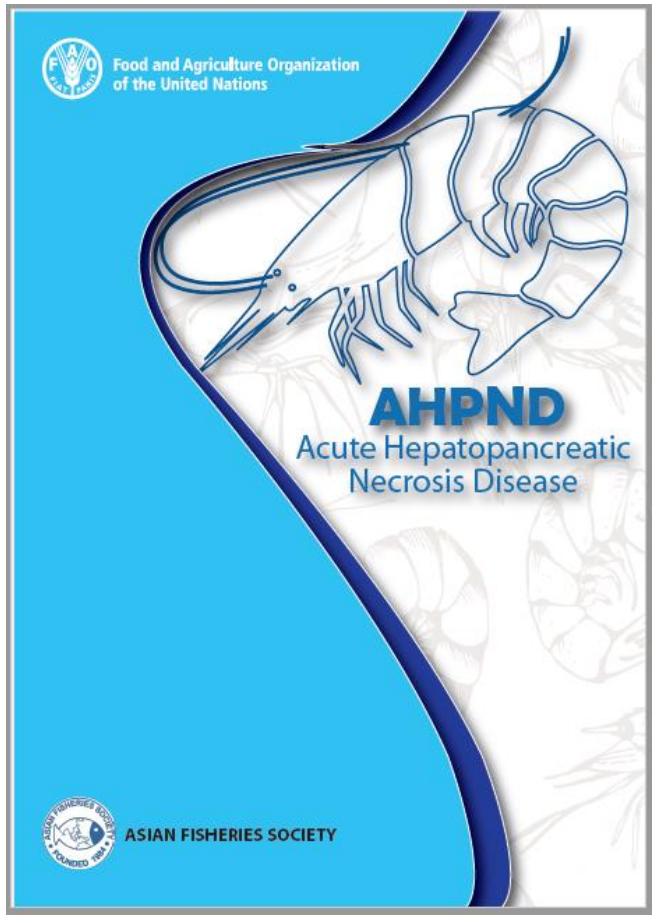
Findings of TCP/VIE/3304

- Causative agent was identified made possible through a Letter of Agreement with UoA (Prof Lightner's lab supported the research of Loc Tran)
- Risk factors identified through cross-sectional active surveillance
- Training of local staff of RIAs, DAH and private sector of AHPND diagnosis and surveillance

FAO/RAHO6 Short EMS Pathology Workshop
Regional Animal Health Office No. 6, Ho Chi Minh City
29-30 June 2013



Case 4: TCP/INT/3502: Reducing and managing the risks of Acute Hepatopancreatic Necrosis Disease (AHPND) of cultured shrimp: USD 422 000; 2015-2017



https://www.asianfisheriessociety.org/publication/archivedetails.php?id=152&q=1

- Two International Technical Seminars: Panama (2015, 105 attendees, 21 countries), Bangkok (2016; 84 attendees, 26 countries): AHPND from the lens of government, scientists and producers
- Better understanding of the: (i) disease (i.e. causative agent, pathogenicity, public health implications, host susceptibility, geographical distribution, detection methods); and (ii) risk factors in terms of: pathways (e.g. movement of infected live shrimp, importation of live animals, e.g. polychaetes, clams, used as feeds for shrimp broodstock; possible vectors/carriers (e.g. crabs, crayfish and other crustaceans; flocs carried long distances by ocean currents; ship's ballast waters; untreated wastes from infected shrimp in processing plants); environmental factors (e.g. high concentration of nutrients in pond water; high temperature; organic-rich sediments).
- Generated practical management and control measures including: farm-level management; reducing the risks of international spread; "clear water", "biofloc", and "green water" systems -that requires improved ecology-based farm and pond management; use of specific pathogen-free stocks and genetic improvement. Ensuring good farm biosecurity and best management practices (BMPs) are still the best approach.
- Two interregional workshops: guidance in the development of National Action Plans on AHPND for 11 countries: Colombia, Ecuador, Guatemala, Honduras, Mexico, Panama, Peru, India, Islamic Republic of Iran, Philippines and Sri Lanka

Case 5: TiLV: Angola

- Angola was very concerned about TiLV and requested for FAO assistance
- Angola explored ASTF funding possibilities, since Angola is one of the main donor for ASTF
- FAO prepared a proposal GCP/RAF/510/MUL: Enhancing capacity/risk reduction of emerging TiLV to African aquaculture
- USD 779 450; 2018-2020; Angola, Ghana, Kenya, Nigeria, Uganda
- Design and implementation of active TiLV surveillance using FAO 12-point surveillance checklist for non-specialists: intensive training course on TiLV diagnostics and surveillance; national implementation of TiLV National action plan

Case 7: TiLV: Angola

The course consisted of 14 sessions, namely: **Session 1:** Country updates on National Action Plans (NAPs) on TiLV; **Session 2**: Diseases of aquatic animals; **Session 3**: Water quality; **Session 4**: Tilapia biology and aquaculture; **Session 5:** Field and laboratory checklist; **Section 6**: What is currently

- known about TiLV; **Session 7**: TiLV diagnostics; **Session 8**: Preparation for field work (experts and participants); **Session 9**: Disease surveillance; **Session 10:** Socio-economic impact assessment; **Session 11:** TiLV Risk assessment; **Session 12**: Individual country work on NAP on TiLVand implementation; **Session 13**: Emergency preparedness and response; **Session 14:** Conclusions and the Way Forward.
- Surveillance data analysis workshop: October 2020
- National implementation: Jan-October 2020 International Technical Seminar on Tilapia Health: 2020

Lessons learned

- The Task Force while it made a difference in identifying the causative agent, it was an *ad-hoc* action, need a more institutionalized mechanism
- Local task force is very important
- Skills and knowledge need to be passed on to locals as they are in the frontline of any disease emergency.
- Importance of detailed documentation; post-mortem evaluation after an outbreak
- Contingency plan
- Risk profile for major aquaculture species
- Enhancing awareness of emerging epizootics and improving diagnostic capacities at national and regional levels

Lessons learned

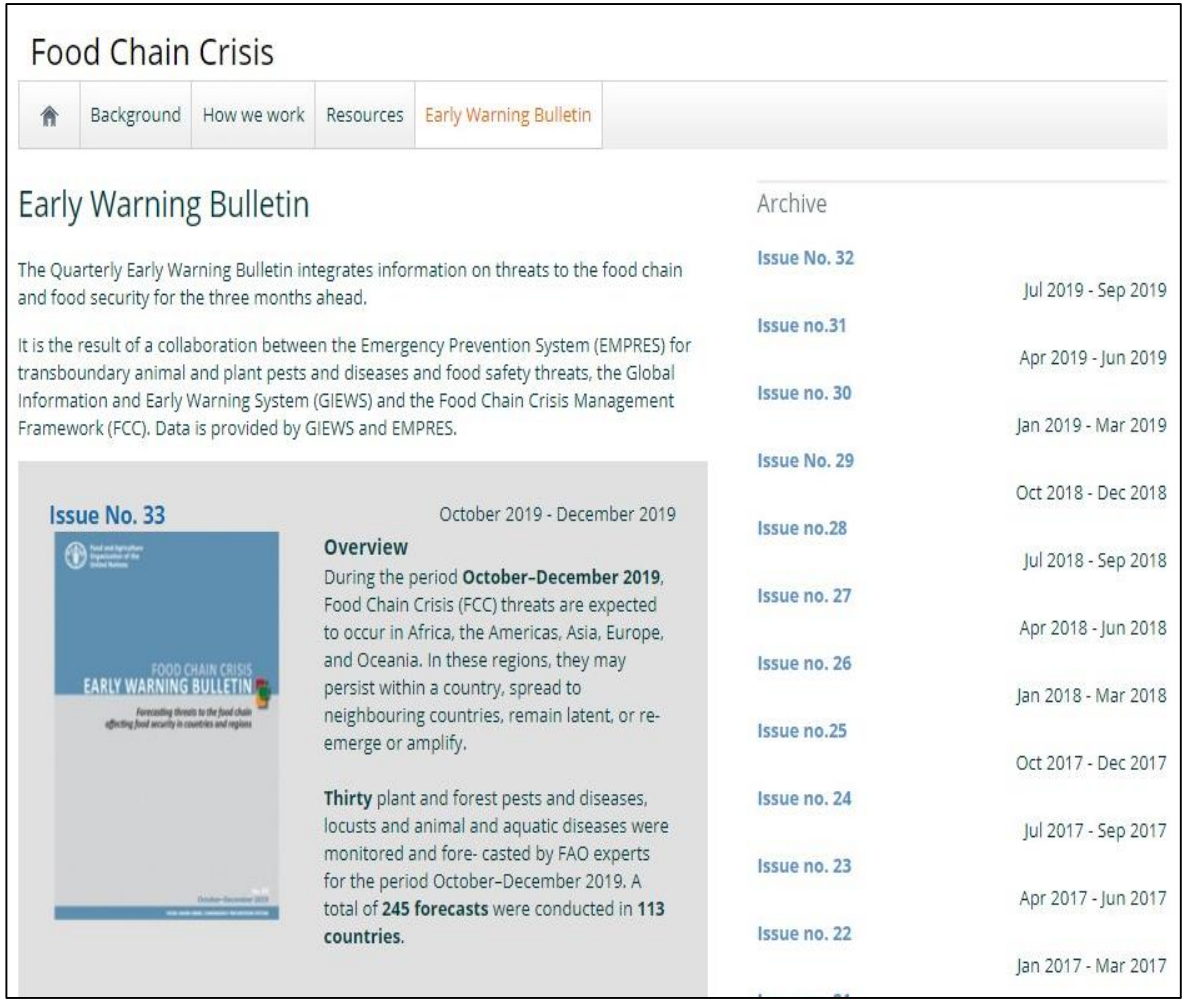
- Proactive reporting of diseases as a mechanism for early warning
- Emergency preparedness as a core function of national authorities with advance financial planning
- Empowering farmers to manage disease and other risks
- Importance of bringing together government, producer sector and academe to look at the disease event from their respective lens
- Strong national commitment from national authorities
- Importance of regional and international cooperation
- Risk communication is important – how to have a communication strategy during a MME that does not create panic to the public

Lessons learned

- How to break stigma of reporting
- How to deal with illegal trade
- Efforts of donors sometimes not sustained
- How to deal with scientific publications preceding national Competent Authority (CA) recognition of disease event
- How to deal with scenario where CA does not recognize private sector initiative to send samples for laboratory tests outside the country just because of the fact that they are not official samples.
- Spill over of pathogens from aquaculture population to wild population and vice-versa

FAO Mechanisms in place to deal with emergencies including aquatic animal disease emergencies

- Emergency TCP
- Crisis Management Center – one case in the past Vietnam EMS/AHPND
- Early warning systems in place
  - Early warning bulletin: once every quarter (advance); forecasting tool



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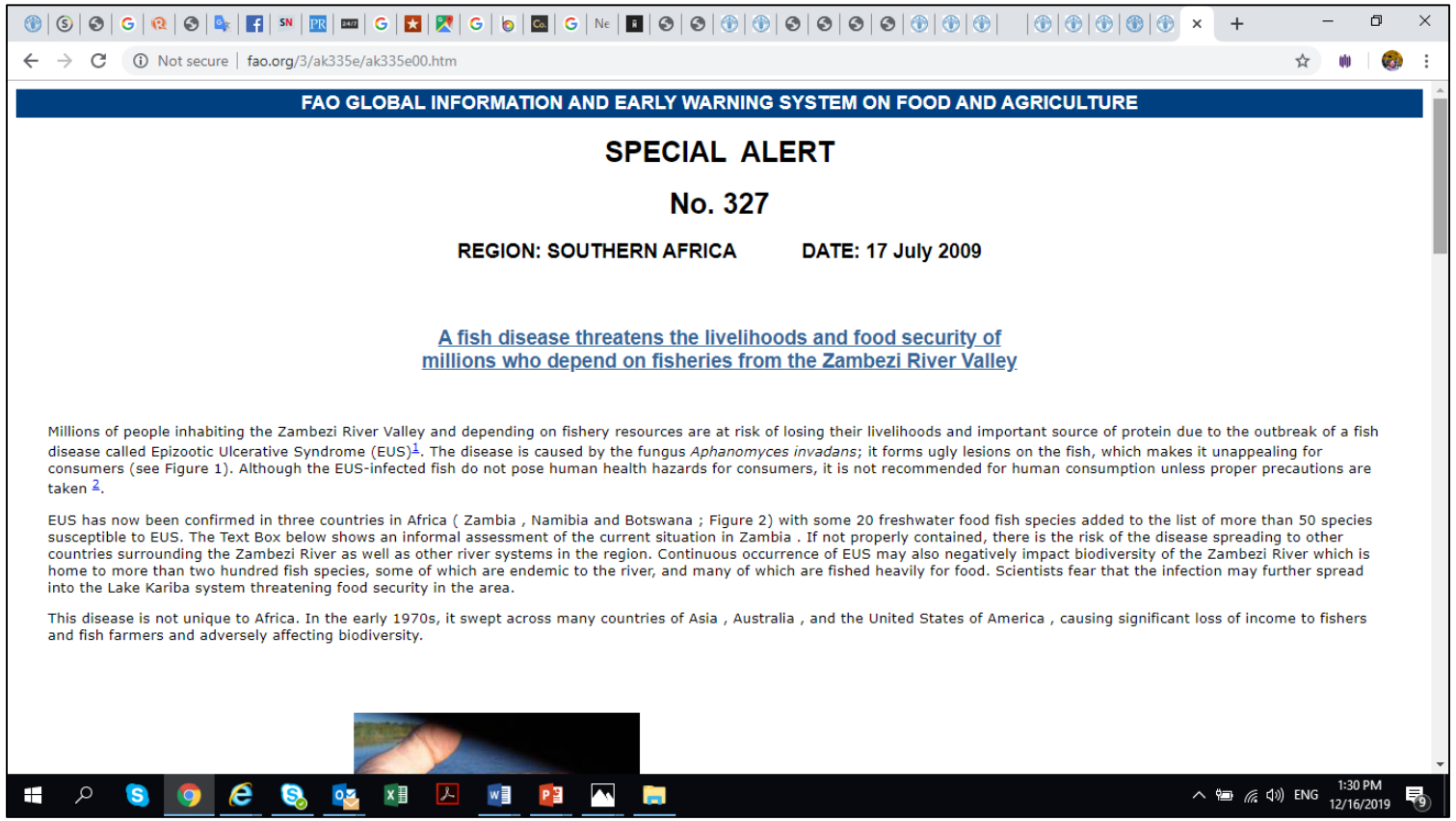

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FAO GLOBAL INFORMATION AND EARLY WARNING SYSTEM ON FOOD AND AGRICULTURE

SPECIAL ALERT

No. 327

REGION: SOUTHERN AFRICA **DATE: 17 July 2009**

A fish disease threatens the livelihoods and food security of millions who depend on fisheries from the Zambezi River Valley

Millions of people inhabiting the Zambezi River Valley and depending on fishery resources are at risk of losing their livelihoods and important source of protein due to the outbreak of a fish disease called Epizootic Ulcerative Syndrome (EUS)[1]. The disease is caused by the fungus *Aphanomyces invadans*; it forms ugly lesions on the fish, which makes it unappealing for consumers (see Figure 1). Although the EUS-infected fish do not pose human health hazards for consumers, it is not recommended for human consumption unless proper precautions are taken [2].

EUS has now been confirmed in three countries in Africa (Zambia , Namibia and Botswana ; Figure 2) with some 20 freshwater food fish species added to the list of more than 50 species susceptible to EUS. The Text Box below shows an informal assessment of the current situation in Zambia . If not properly contained, there is the risk of the disease spreading to other countries surrounding the Zambezi River as well as other river systems in the region. Continuous occurrence of EUS may also negatively impact biodiversity of the Zambezi River which is home to more than two hundred fish species, some of which are endemic to the river, and many of which are fished heavily for food. Scientists fear that the infection may further spread into the Lake Kariba system threatening food security in the area.

This disease is not unique to Africa. In the early 1970s, it swept across many countries of Asia , Australia , and the United States of America , causing significant loss of income to fishers and fish farmers and adversely affecting biodiversity.

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Food and Agriculture Organization of the United Nations

GLOBAL INFORMATION AND EARLY WARNING SYSTEM ON FOOD AND AGRICULTURE (GIEWS)

SPECIAL ALERT

No. 338

REGION: Global **DATE: 26 May 2017**

Outbreaks of Tilapia lake virus (TiLV) threaten the livelihoods and food security of millions of people dependent on tilapia farming

Highlights

- Tilapia lake virus (TiLV) poses a great threat to the tilapia sector. Tilapias are farmed globally and are the second most important aquaculture species in terms of volumes produced, providing a key source of affordable animal protein, income to fishfarmers and fishers, and domestic and export earnings.
- TiLV has been confirmed in some countries in Asia, Africa and Latin America. It is likely that TiLV may have a wider distribution than is known today and its threat to tilapia farming at the global level is significant.
- While there is no public health concern for this pathogen, there is a significant risk of TiLV being translocated both inter- and intra-continentally through the movement of infected live tilapias in the absence of appropriate biosecurity measures.
- Tilapia producing countries need to be vigilant and take appropriate risk management measures (e.g. enhanced diagnostic testing of imported stocks and unexplained tilapia mortalities and reporting to biosecurity authorities, active surveillance, public information campaigns and contingency plans) to reduce the further spread and potential socio-economic impacts of this emerging disease.

An outbreak of fish disease Tilapia lake virus (TiLV), an orthomyxo-like virus belonging to the family Orthomyxoviridae, threatens to compromise the livelihoods and food security of millions of people, particularly of highly vulnerable subsistence fishers and small fish farms. The disease is highly pathogenic, with no known control methods, and poses significant threat to cultured and wild stocks of tilapia. Infected fish often show loss of appetite, slow movement, dermal lesions and ulcers, ocular abnormalities, and opacity of lens.

Tilapias are often transported, live or in processed form, between countries and many nations may still be unaware of the emerging threat posed by TiLV. Several countries have experienced significant mortalities of tilapia, but have not yet identified the cause. A reliable diagnostic test for TiLV is available and it should be applied to rule out TiLV as the causative agent of unexplained mortalities. As of today, the TiLV has been confirmed in some countries in Africa, Asia and Latin America. There is a significant risk of TiLV being translocated both inter- and intra-continentally through the movement of infected live tilapias in the absence of appropriate biosecurity measures. There is no public health significance for this pathogen. More research is urgently needed to determine if the virus is transmitted via frozen tilapia products. *It is likely that TiLV may have a wider distribution than is known today and its threat to tilapia farming at the global level is significant.*

- FAO GIEWS Special Alert
- EUS and TiLV