



Emergency Response in Aquaculture Saudi Arabia experience

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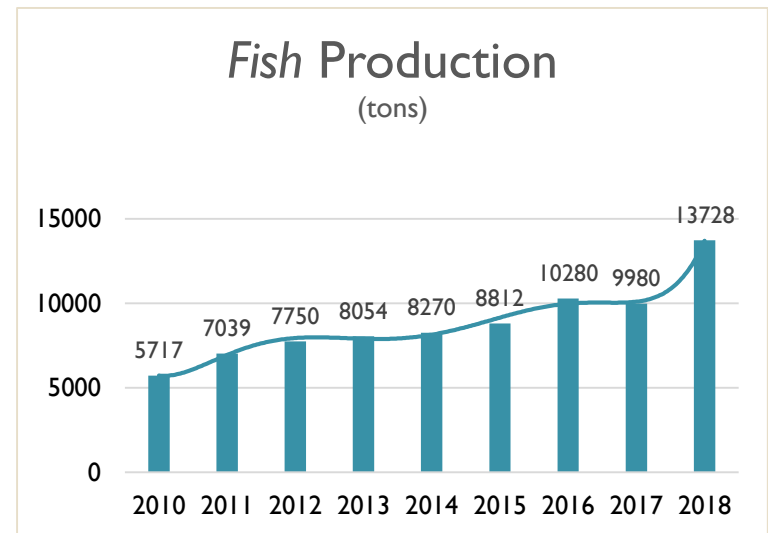
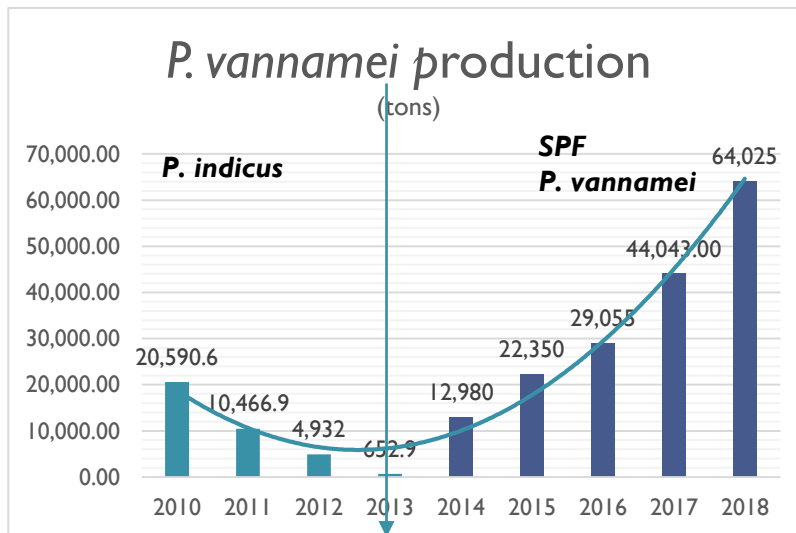


Content

- Aquaculture in KSA
- Organization
- Aquaculture Regulations
- Biosecurity strategy
- Aquatic animal health issues
- National Planning for Emergency Preparedness

Aquaculture in KSA

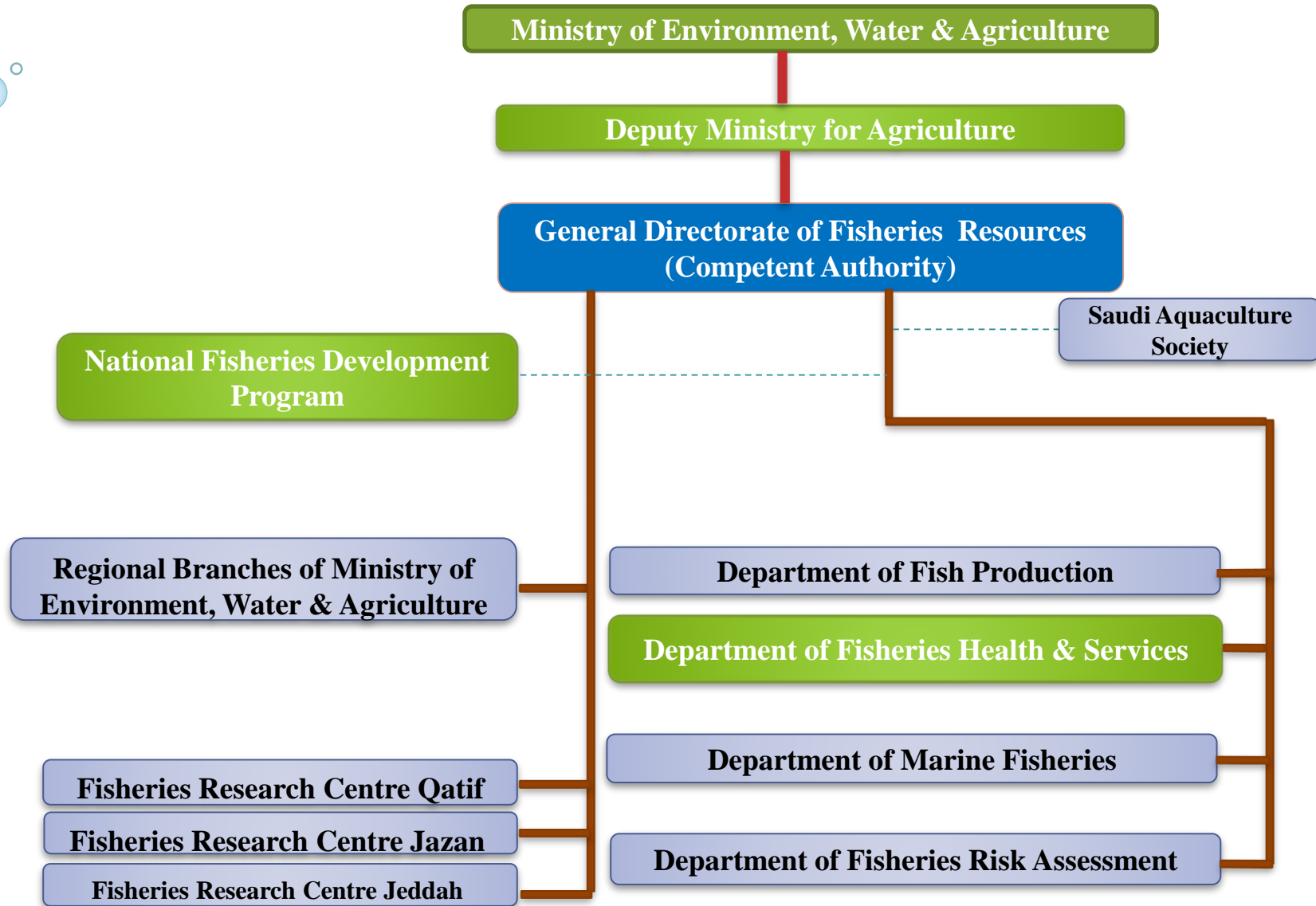
- *Penaeus vannamei*, Barramundi , European seabass, Gilt-head bream, Silver seabream and Tilapia.



New biosecurity strategy



Organization



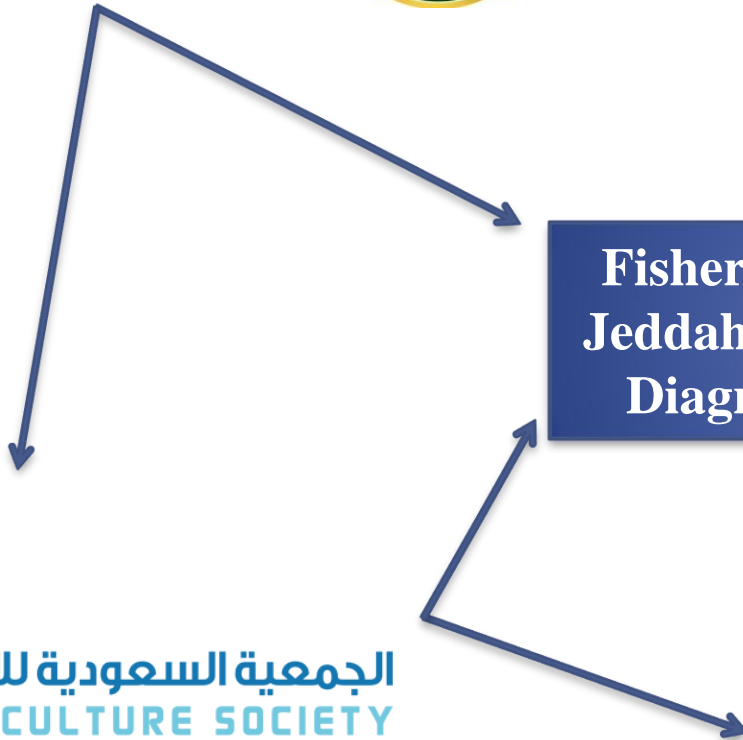
Private Public Partnership (PPP) for BIOSECURITY

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Ministry of Environment Water & Agriculture
المملكة العربية السعودية Kingdom of Saudi Arabia



Fisheries Research Centre
Jeddah (National Reference
Diagnostic Laboratory)

Stakeholders





Role of GDF-MEWA

Competent Authority

The General Directorate of Fisheries of Ministry of Environment, Water and Agriculture (GDF-MEWA)

- ❖ Issue aquaculture license
- ❖ Issue of regulations
- ❖ Inspection of production facilities
- ❖ Aquaculture Biosecurity
- ❖ Inspection of local and foreign establishments
- ❖ Approval of importation of aquatic species
- ❖ Issuance of Health Certificates for animal movement and product exports
- ❖ Emergency plan
- ❖ Overall monitoring of Aquaculture sector in Kingdom





Saudi Aquaculture Society (SAS)

- Communication link between MEWA and production facilities
- Samples & data collection for routine surveillance and emergency cases
- Third Party Auditing for biosecurity (pre-stocking and quarterly audit)
- Communication for reporting and emergency responses
- Function as a center point to coordinate between public and private parties

Jeddah Fisheries Research Center (JFRC)

- National Reference Diagnostic Laboratory
- Auditing (onsite) and reporting
- Diagnostic service (PCR, histology, microbiology, parasitology)
- Carry out the surveillance sample and emergency sample analysis



KSA listed pathogens (**wider than OIE list**)

- ❖ This list of pathogens is dynamic and updated on regular basis, based on the information generated within KSA and worldwide.
- ✓ Acute hepatopancreatic necrosis disease (AHPND)
- ✓ **Enterozoan penaei (EHP)**
- ✓ **DIV1 Decapod iridescent virus (or SHIV)**
- ✓ Infectious hypodermal and haematopoietic necrosis virus (IHHNV)
- ✓ Infectious myonecrosis virus (IMNV)
- ✓ Necrotising hepatopancreatitis (NHP)
- ✓ ***P. monodon* baculovirus (MBV)**
- ✓ Taura syndrome virus (TSV)
- ✓ White spot syndrome virus (WSSV)
- ✓ Yellow head virus genotype1 (YHV1)
- ✓ **Tetrahedral baculovirus (BP)**
- ✓ **Viral nervous necrosis (VNN) - Nodavirus**
- ✓ Red seabream iridoviral disease - Iridovirus
- ✓ **Tilapia Lake Virus (TLV)**

Pathogens affecting KSA aquaculture

- Shrimp
 - WSSV
 - Previously detected: TSV, IHHNV, BP (not anymore)
- Fish
 - Brooklynella
 - Tenacibaculum
 - Previously detected: Streptococcus sp. (agalactiae and iniae), Viral nervous necrosis (VNN).





National Planning for Emergency Preparedness:

- Disease outbreaks**
- Aquatic product sanitary barriers**

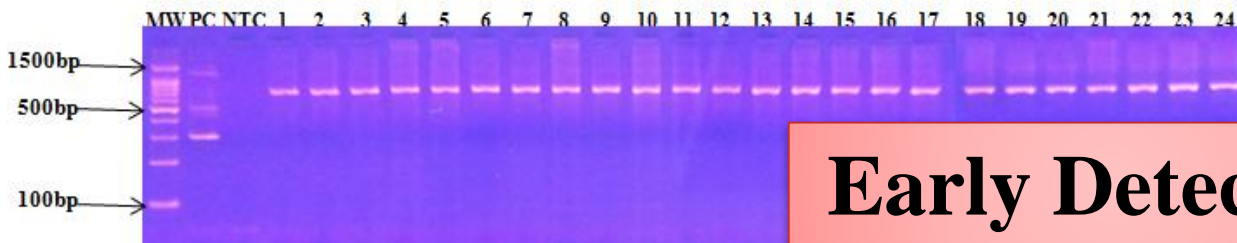


Disease outbreaks

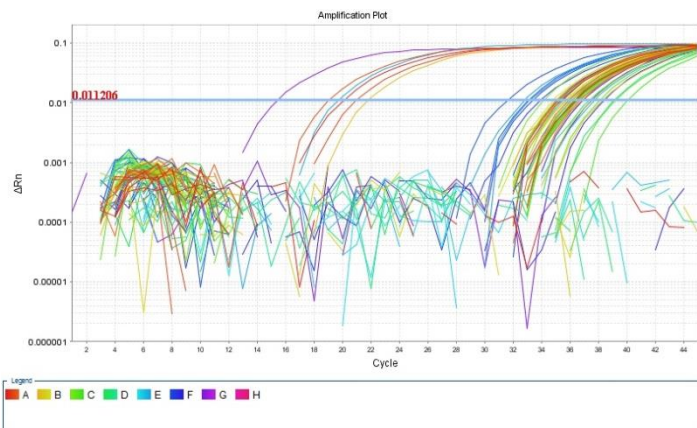


Early Warning

EEE



Early Detection



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 Fisheries Research Center
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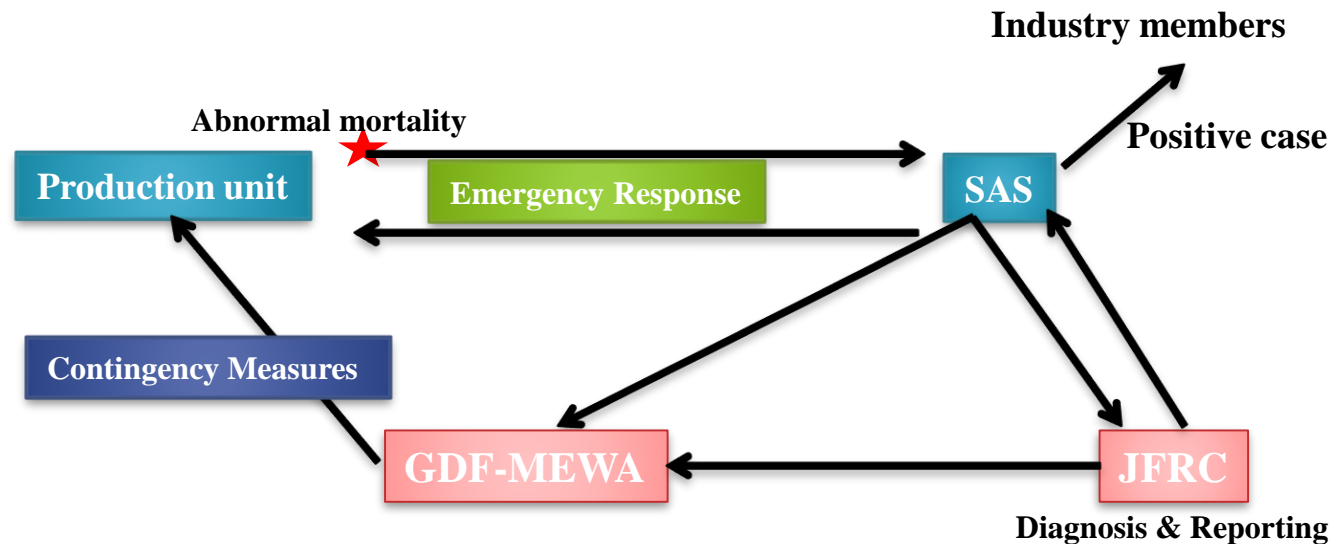
ANALYSIS REPORT
 VIROLOGY LABORATORY

Customer Information		Sample Received Date: 09-11-2019
Sample Submitted by: SAS (Surveillance Project)		
Sampling Date: 07-11-2019	Lab Report No.: V11911_317	Date of Report: 12-11-2019
Total No. of Samples: 23	Type of analysis: Real-time PCR	

JFHSL Ref No	Lab Ref No	Place		Reason	Sample Description	Test's								
		Location	Site			SSV	SNV	IP	SP	SV	SV	SV	SV	
19112649	1918													
19112650	1919													
19112651	1920													
19112652	1921													
19112653	1922													
19112654	1923													

Early response

National Planning for Emergency Response



Saudi aquaculture industry is no more facing the issues of mass mortality due to availability of;

- SPF+SPT animals
- Advanced biosecurity measures
- Surveillance program in place for early detection
- 100% BAP implementation to all farms in KSA



Emergency response

- Routine surveillance in place (monthly for each facility)
- Report of abnormal mortality by the producer
- MEWA and SAS visit within 24h
 - Collection of sample for histology and PCR
 - Investigation and data collection through a standard document
 - On site assessment of biosecurity measures in place and their effectiveness
- Once a listed pathogen is confirmed, diagnosis of each pond/tank/cage is made before a decision is taken (harvest or culling)
- The effluent canal may be blocked to minimize the risk to neighboring farms
- A member of MEWA/SAS remains in the farm enforcing decision
- There is no compensation for loss of crop

Contingency plan

Objective: minimize impact and recover production as soon as possible

- ❖ Affected stock will be harvested, eliminated (SOP. 8, National Biosecurity Manual)
- ❖ Decision will be based on:
 - ❖ Stage affected
 - ❖ Value of the affected stocks
 - ❖ Sanitary status of the farm/industry
 - ❖ Risk to the rest of the industry
 - ❖ Season and weather forecast etc.
- ❖ If, not culled, increased monitoring of Animal Health and mortality on affected ponds kept in production
- ❖ Infected farms shall be fallowed after emptying, cleaned and disinfected.
- ❖ Biosecurity measures of farms will be audited prior approval for stocking again



SOP 8. Contingency plan

Upon presence of any of the ADMEWA listed diseases in the category C1 in Quarantine, breeding program, commercial broodstock, post larva and nursery or massive mortality in grow-out ponds, the affected stock will be harvested or eliminated depending on the economic value. See table below.

Pathogen	Category	Quarantine	Breeding program	Commercial broodstock	Post larvae & nursery	Grow out
High risk						
EMS	C1	Eliminate	Cleaning	Eliminate	Eliminate	Harvest/eliminate
WSSV	C1	Eliminate	Cleaning	Eliminate	Eliminate	AM Temperature SOP: MohRox*
						AM Temperature SOP: Harvest/ /Eliminate
IMNV	C1	Eliminate	Cleaning	Eliminate	Eliminate	Harvest/eliminate
TSV	C1	Eliminate	Cleaning	Eliminate	Eliminate	Harvest/eliminate
YHV	C1	Eliminate	Cleaning	Eliminate	Eliminate	Harvest/eliminate
Moderate risk						
EHP	C2	Eliminate	Cleaning	Eliminate	Eliminate	Eliminate /harvest if severe
NHP	C2	Eliminate	Cleaning	Eliminate	Eliminate	Eliminate /harvest if severe
Low risk						
IHHNV	C3	Eliminate	Cleaning	Individual selection	-	-
BP	C3	Individual selection	Cleaning	Individual selection	Eliminate if severe	-
MBV	C3	Individual selection	Cleaning	Individual selection	Eliminate if severe	-



Minimum response requirements

- **Awareness** of the industry about their responsibility to report
 - The industry needs to feel that reporting is useful (MEWA support)
- A team to be deployed to the site within 24h for assessment and sample collection
- Emergency diagnosis (PCR and histology within 24h)
- Contingency plan previously agreed with the industry
- Having the authority to enforce it



International Trade Barriers



Sanitary Issues

Yellow Head virus 1 detection (YHV) by Chinese customs

- ❖ Resulted in ban on shrimp imports
- ❖ Revision of surveillance program and PCR protocols
- ❖ Analysis of counter sample
- ❖ Analysis of returned products and sent to OIE Reference Lab (CSRIO) 30 samples
- ❖ All negative

Middle East respiratory syndrome (MERS)

- ❖ Delay in customs due to several days in quarantine facilities
- ❖ Working on declaration of shrimp farm as a compartment free of MERS based on:
 - ❖ Absence of MERS carriers (camel) in the farm
 - ❖ Surveillance of Processing Plant workers



Processing Plant staff

Shrimp Processing Plant											
SL#	Sections	Manpower	Nationality		Direct Product/Facility Access		Saudi Residence		Non Saudi Residence		Remarks
		Total Manpower	Non-Saudi	Saudi	Total On Floor (Saudi & Non-Saudi)	Saudi On Floor	Inside NAQUA	Outside NAQUA	Inside NAQUA	Outside NAQUA	
1	Plant Shift Production	451	438	13	449	13	0	13	438	0	Direct Product handling
2	Value Added Production-Ladies (Production,QC,HR)	129	0	129	127	127	0	129	0	0	Direct Product handling
3	QA & QC	38	37	1	36	1	0	1	37	0	Direct Product handling
4	Hygiene	35	33	2	34	2	1	1	33	0	Indirect Product Handling (Floor Access Only)
5	Engineering	49	47	2	38	2	0	2	47	0	Indirect Product Handling (Floor Access Only)
6	HR	2	1	1	0	0	1	0	1	0	No Access to Floor
	Total	704	556	148	684	145	2	146	556	0	

Ladies Processing Facility

Fish Processing Plant

SL#	Sections	Manpower	Nationality		Direct Product/Facility Access		Saudi Residence		Non Saudi		Remarks
		Total Manpower	Non-Saudi	Saudi	Total On Floor (Saudi & Non-Saudi)	Saudi On Floor	Inside NAQUA	Outside NAQUA	Inside NAQUA	Outside NAQUA	
1	Plant Shift Production	62	62	0	59				62	0	Direct Product handling
2	QA & QC	4	3	1	3	1		1	3	0	Direct Product handling
3	Hygiene	7	7	0	7				7	0	Indirect Product Handling (Floor Access Only)
4	Engineering	5	5	0	5				5	0	Indirect Product Handling (Floor Access Only)
	Total	78	77	1	74	1	0	1	77	0	

Surveillance program design

- 2 groups exposed to different degrees of risk
- Detection of a minimum prevalence of 2% for high risk individuals and 10% for low risk individuals.
- Frequency: monthly

Sample size:

- Shrimp processing plant: 829
 - Residents in Naqua: 556 Monthly samples: 127
 - Residents outside Naqua: 146 Monthly samples: 24
- Fish processing plant: 74
 - Residents in Naqua: 73 Monthly samples: 21
 - Residents outside Naqua: 1 Monthly samples: 1



THE END

**Be Ready for the next event that happens, both in the farm
and in the international trade**

Emergency preparedness & advanced preparedness

**Further international agencies support needed for
international trade barriers based on sanitary reasons**



Thank You for your Kind Attention