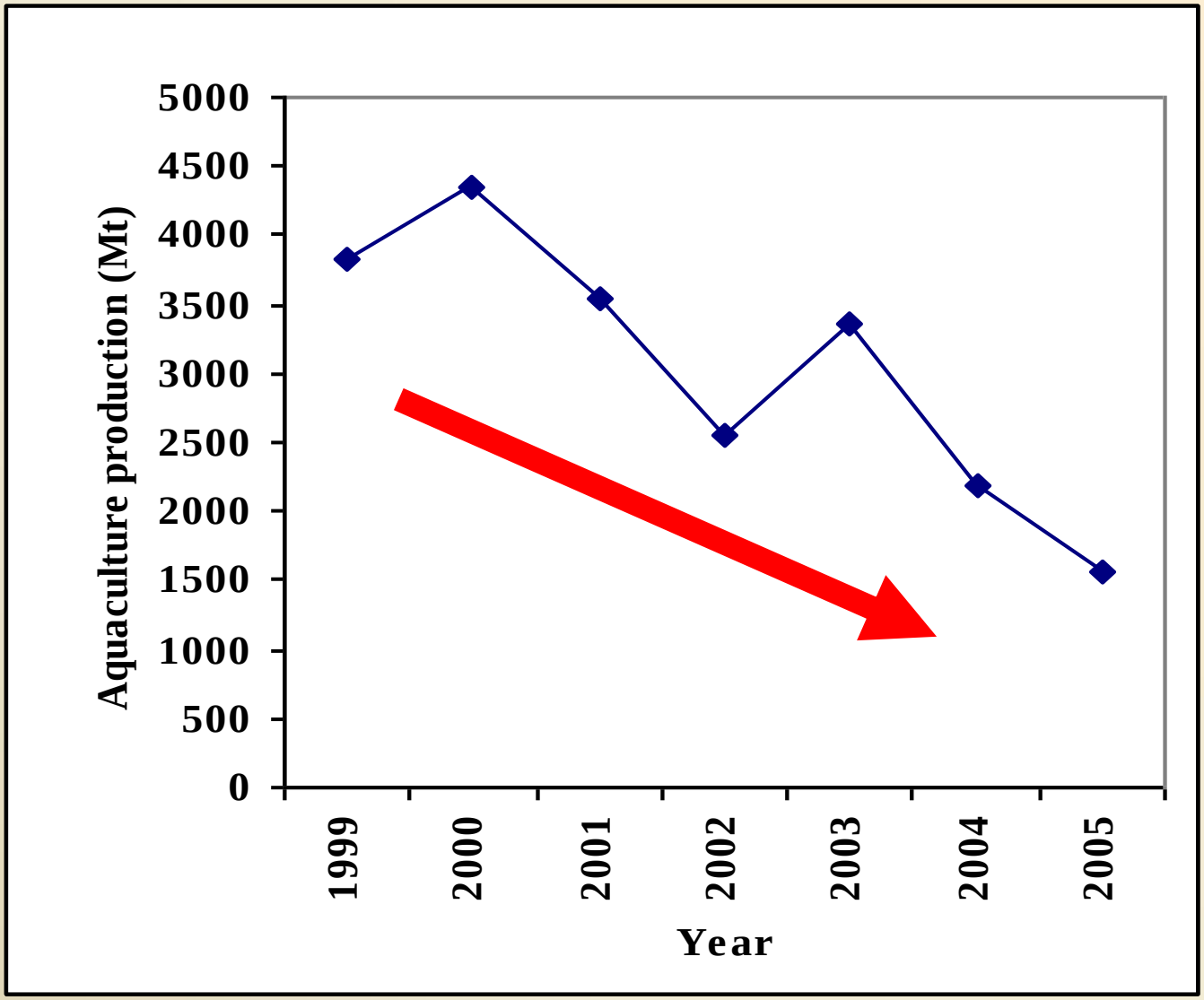
Government role in development of shrimp aquaculture industry in the past 10 years and beyond 2016

Background of shrimp aquaculture industry in Sri Lanka

- The shrimp aquaculture industry initially emerged in the Eastern Province
- It collapsed due to civil war
- The industry was revived in the North Western Province in 1980
- The industry recorded its peak economic performances in the year 2000 by earning Mn USD 69.4 worth of foreign exchange – 4855 mt
- There was a severe threat from White Spot Disease in the past and it was firstly appeared and affected shrimp aquaculture in 1996.

- Shrimp production came down up to 1570 mt in 2005



Impact of the WSSV to draw down the shrimp aquaculture production

- All the stakeholders of the industry stressed and compelled to the Government, there should be a new proper management system to control the adhoc aquaculture practices and uplift the existing management system of the shrimp aquaculture industry.

- After having necessary consultations with all the industry stakeholders following strategies were implemented

Strategies Implemented

1. Establishment of Shrimp Farm Monitoring and Extension Unit
2. Zoning
3. A Society was formed for each sub zone
4. New association was formed and it was comprised with shrimp breeders, shrimp farmers, feed suppliers, chemical suppliers, consultants, etc.
5. Co-management system and public private partnerships were established with NAQDA
6. Establishment of PCR laboratory, Disease diagnosis laboratory, Water quality laboratory and Algae culture unit
7. Dredging of Dutch canal
8. Demarcation of the Dutch canal Reservation
9. Mangrove Plantation

Strategies Implemented

10. Implementation of Crop Calendar
11. Implementation of BMPs
12. New Regulations
13. Implementation of Hatchery Grading system
14. Special bio security measures
15. Broodstock screening for WSSV

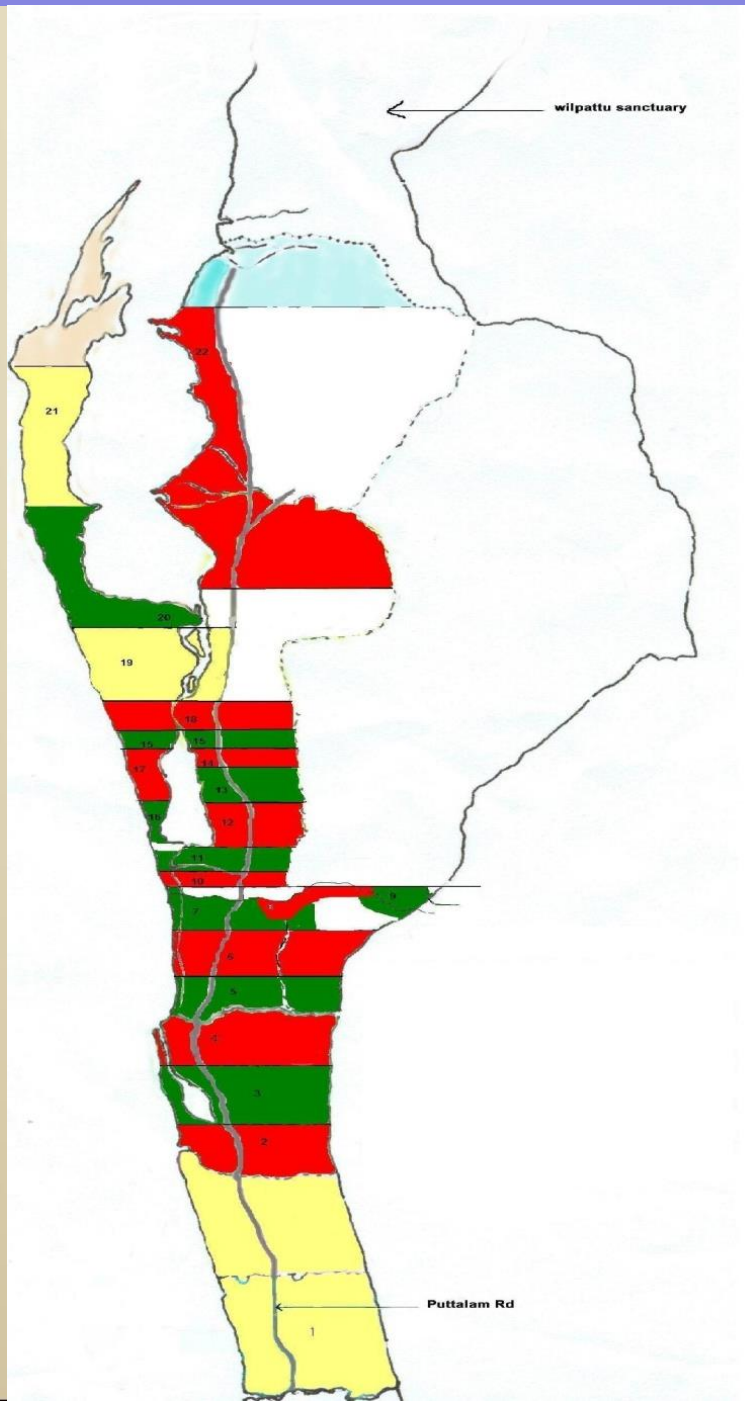
Establishment of Brackish water fish health laboratory complex attached to the SFM&EU at Bathulu Oya

Three Laboratories

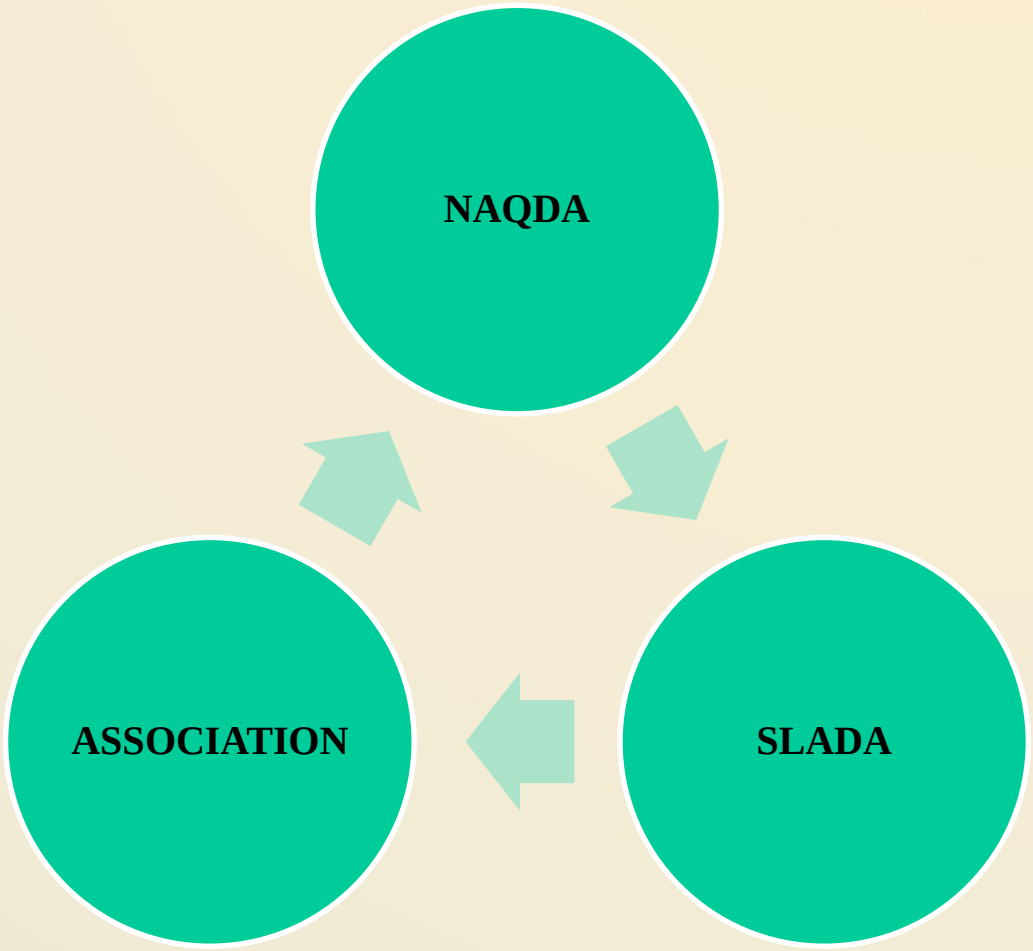
- PCR laboratory
- Disease diagnosis laboratory
- Water quality laboratory and Algae culture unit

4319 PCR tests done by the PCR laboratory to screening the WSSV disease in 2015

Zoning



Public Private Partnership



Dredging of Dutch Canal

- Majority of the farms depends on the Dutch Canal as the common source of the supply of water
- The water intake and discharge was carried out using same canal and it caused pollution
- Deterioration of water quality in Dutch Canal was affected to create positive environment to the spread of White Spot disease
- Dutch Canal was also silted and therefore water flow was also inhibited

Dutch Canal

Demarcation of the Dutch canal Reservation

Mangrove Plantation

Implementation of Crop Calendar

Ministry of Fisheries & Aquatic Resources Development

National Aquaculture Development Authority of Sri Lanka (NAQDA)

Notice to Shrimp Farmers in the North Western Province

1. Zoning plan/crop calendar for post Maha seasons of the year 2011 from the month of July onwards is given below. This has been formulated by the National Aquaculture Development Authority of Sri Lanka with collaboration of the Ministry of Road Development, Electricity, Housing & Construction and Fisheries, North Western Province & Shrimp farmers organizations, in accordance with the regulations specified under the Shrimp Aquaculture Management (operation of crop cycle) 2008 of National Aquaculture Development Authority of Sri Lanka, Act No. 53 of 1998.

Zoning Plan - Crop Calendar - 2011 (Pera Maha & Maha)

Zone	Subzone	Period for Post Larvae stocking
Zone - 1	1 Thalwila	July 20 - Aug. 20
	2 Thoduwawa/Iranawila	July 20 - Aug. 20
	3 Madampe	Aug 20 - Sep. 20
	4 Kakkapalliya	July 20 - Aug. 20
	5 Ambakandawila	July 20 - Aug. 20
	6 Marawala / Suduwella	July 20 - Aug. 20
	7 Wattakkalliya/Jayabima	July 20 - Aug. 20
Zone - 2	1 Bangadeniya 2 Kusala / Kottage 3 Wairankattuwa 4 Bogahawetiya 5 Nagul Eliya 6 Muthupanthiya 7 Pinkattiya 8 Udappuwa 9 Pulichchakulama	No permission will be given due to prevailing dry situation
Zone - 3	1 Punapitiya / Watawana	Dec. 01 - Dec. 31
	2 Koththanthiv	
	3 Keriyankalliya	Oct. 01 - Oct. 31
	4 Mundal/Mangala Eliya	Nov. 01 - Nov. 30
	5 Madurankuliya South	Nov. 01 - Nov. 30
	6 Madurankuliya . Sembatta	Nov. 01 - Nov. 30
	7 Pulidiwayal	Nov. 01 - Nov. 30
Zone - 4	1 Karamba	Nov. 01 - Dec. 01
	2 Mampuriya / Eththale	Nov. 01 - Dec. 01
	3 Palliyavasathure/Kandakuda	Nov. 01 - Dec. 01.
Zone - 5	1 Palaviya / Poorvasakuda	Sep. 15 - Oct. 15
	2 Sewwanthivu	Sep. 15 - Oct. 15
	3 Manathivu	Sep. 15 - Oct. 15
	4 Aneikutti / Malayamadu	Sep. 15 - Oct. 15
	5 Meeoya	Sep. 15 - Oct. 15
	6 Wadathamunei / Samagipura	Sep. 15 - Oct. 15
	7 Wanathawilluwa	Sep. 15 - Oct. 15

2000 ha/year

2 (a) The time table of shrimp farming for North Western Province will be implemented under five zones. In addition favourable, risk and high risk periods are declared for stocking of Post Larvae for respective zones. The details are as follows.

Zone	Favourable period	Risk period	High risk period
01, 02	January to June	July to September	October to December
03, 04, 05	Oct. to March	April to June	July to September

(b) Considering the facilities available at the farm and culture method adopted, grading of the shrimp farms will be carried out in due course. Maximum duration for stocking of Post Larvae in the favourable period is only two months and if required to stock during risk period, stocking or post larvae should be done within one month period. However, crop cycle should be completed within the 6 months period allowed.

(c) The boundaries of each Zone and sub zone could be obtained from the Shrimp Farm, Extension & Monitoring Unit of NAQDA, based in Bathtuluoya.

(d) Any farm (Excluding Zone 5) should not be stocked during high risk period (Special permission granted to the Zone 5 only for this cycle, considering special reasons).

3. (a) Shrimp farmers in each sub zone are allowed to carry out stocking and farming activities within a period of six months from the date of commencing the crop cycle.

(b) Post Larvae should not be stocked without a permit, issued by the relevant Zonal office of Shrimp Farm Extension & Monitoring Unit of NAQDA

Under the rehabilitation programme of the shrimp farming industry in the North Western Province, which is being implemented, action has already been initiated by an Inspection Committee to regularize and certify shrimp farms. All shrimp farms should take immediate action to obtain Aquaculture Management Licences from NAQDA, prior to the date specified by the above Inspection Committee. NAQDA will take legal action under Fisheries and Aquatic Resources Act No. 2 of 1996 against any shrimp farmer who fails to do so and attempts to commence activities in their respective shrimp farms without an Aquaculture Management Licence.

For further details - Shrimp Farm Extension & Monitoring Unit
Bathtuluoya
Tel - 032-3326666

Chairman
National Aquaculture Development Authority of Sri Lanka

Implementation of Better Management Practices

- Better Management Practices
  - ✓Shrimp farming
  - ✓Shrimp hatcheries
  - ✓Shrimp harvesting
  - ✓Brood Stock Collectors
  - ✓Feed & Chemical suppliers, feed and feeding
- With the implementation of Crop calendar strictly monitored the Better Management Practices (BMP) which have been formulated in consultation with all the stake holders in the industry

Best Management Practices

Best Management Practices for Harvesting Brackish Water Shrimp (P .Monodon)

a. BMP for normal harvest

i. Before harvest

1. Water change for the ponds one week prior to harvest is recommended. This will enhance molting and enables clean healthy shrimps at harvest.
2. Antibiotics disinfectants or any other chemical should not be apply to the ponds immediately before harvest
3. It is not suitable to stop feeding three to four days prior to harvest and stopping a single feeding time before harvest will be sufficient.

ii. At harvest

1. The harvesting should be done in the morning or evening with minimum sunlight and heat in order to prevent dehydration or shrimp and stress
2. The harvesting time period should not exceed more than six hours.
3. The physical damages to shrimps should be minimized at harvest
4. Clean, dry, disinfected utensils should be used for harvest
5. Greater care should be focused on the general hygienic practices of workers employed for the harvest
6. Entry of animals such as dogs and cats should be prevented at the harvesting site
7. Harvested shrimp should not be kept in the net or pond bottom for longer periods

iii After Harvest

1 Shrimps should be immersed in a solution of ice, water and salt immediately after harvest and then immersed in 0.2 – 0.5 % sodium metabysulphate solution for 1 to 2 minutes. The application of sodium metabysulphate should be done according to the requirement of purchaser

2 Shrimps should be packed in clean plastic containers with ice at a ratio of 2:1 to (ice and shrimp). Plastic containers are better than Styrofoam containers for the storage and transport of shrimps as plastic containers are easy to clean and durable than Styrofoam containers.

3 In the process of weighing, sorting, grading of shrimps the temperature needs to be maintained below 4 ^{0}C

Best Management Practices for Chemical Suppliers & Importers for the Shrimp Industry.

(1) Registration

1.1 All Supplier/Importer/Manufacturer/Local producer should be registered under the Department of Animal Production & Health.

1.2 Inspections should be carried out by the Department of Animal Production & Health.

(2) Labelling

2.1 Labelling must be in three Languages.

2.2 Proper guidelines for using chemicals must be included.

2.3 The following items should be included in the label.

i. Common name with the active ingredients & strength/Trade name/Scientific name.
ii. Name & the address including country of the manufacturer.
iii. Instructions and details for repacking (Address & Telephone Nos)
iv. Batch No / Stock No.
v. Date of manufacture/Date of packing/ Date of Expiry/Volume and weight.
vi. Instruction for storage & transport.
vii. Purpose of usage.
viii. Dosage.
ix. Withdrawal period of the product.
x. Prior protection Instruction.

Special signs should be printed with attraction as follows;

eg:- Danger - to be stored in a safe place away from children.

- Separate logo for the Registration should be included.
- Separate logo should be used for the products to the shrimp Industry.

Code of good farming practices

1. Design

1.1 Each farm should also have a sufficient sedimentation area, a minimum of not less than 10% of the total area of its culture pond (or ponds). This can be either a dugout pond or a natural depression (waterhole). Its purpose is to hold water discharged from the culture pond for sedimentation of suspended matter, and if necessary for treatment, before releasing to the draining system outside the farm.

1.2 The sedimentation area should also be identified in the plan No shrimp should be stocked in the sedimentation area

1.3 It is recommended that as a better option, water-recycling systems be installed in farms, especially in those exceed 4 ha. In extend.

2. Treatment of water

2.1 Water taken to the reservoir from the water source should be filtered through a screen containing 576 mesh per square inch. Water should be retained in the reservoir for not less than 7 days before taking in to the culture pond. It is recommended that water in the reservoir be treated with chlorine the rate of 30 ppm. on the fourth day, followed by aeration on the fifth day and onwards.

3. Culture Operations

3.1 Pond should be stocked with post-larvae not less than 20 day old post larvae (PL-20) , the post-larvae used for stocking be screened for viral infection which was informed by SFMEU using PCR equipment. The formalin stress test on post-larvae should be performed only on randomly selected samples and not on the entire stock.

3.2 It should be noted that ponds be stocked at a density of 4-6 post-larvae per square meter. However, ponds may be stocked up to 10 per square meter if provided with mechanical aeration. Stocking density should be exceed 10 per square meter under any circumstance.

3.3 Measures should be taken to maintain pH of water in culture ponds at 7.8 – 8.5 Hydrated lime should be used to increase the pH of pond water only when it drops below 7.5 Hydrate lime may also be used on soils with a pH of less than 5 during pond preparation . In all other cases use of hydrated lime should be avoided.

3.4 After filling the ponds, the water may be fertilized depending on the soil fertility

New Regulations

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The Gazette of the Democratic Socialist Republic of Sri Lanka
EXTRAORDINARY

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No. 1536/12 - WEDNESDAY, FEBRUARY 13, 2008

(Published by Authority)

PART I : SECTION (I) — GENERAL

Government Notifications

L.D.B. 2/99.

THE NATIONAL AQUACULTURE DEVELOPMENT AUTHORITY OF SRI LANKA ACT, NO. 53 OF 1998

REGULATION made by the Minister of Fisheries and Aquatic Resources under paragraph (c) of Subsection 2 of Section 37 of the National Aquaculture Development Authority of Sri Lanka Act, No. 53 of 1998.

FELIX PERERA,
Minister of Fisheries and Aquatic Resources.

Colombo,
28th January, 2008.

Schedule

1. These regulations may be cited as the Shrimp Aquaculture Management (Operation of Crop Cycle) Regulations, 2008.

2. The provisions of these regulations shall apply to all licensed shrimp aquaculture enterprises.

3. The operation of any licensed shrimp aquaculture enterprise shall be in accordance with the cultivation timetable issued by the Director - General of National Aquaculture Development Authority of Sri Lanka (hereinafter) referred to as "the Director General") for the purpose of proper management and regulation of such enterprise.

4. The Director-General may, cause to be published in the local Newspapers in the Sinhala, Tamil and English languages, a list of Zones where the provisions of this regulation shall be operating (hereinafter referred to as "demarcated zones") along with the cultivation time table applicable to all licensed shrimp aquaculture enterprises.

5. *(a)* Any licensee of a shrimp aquaculture enterprise, shall maintain a register for the purpose of recording any information relating to the implementation of the provisions of the cultivation timetable.

(b) The register maintained under paragraph (a) shall be available for inspection by the Director-General or Inspector or any other officer authorized by the Director-General in that behalf.

1A

Shrimp Aquaculture Management (operation of crop cycle) Regulation 2008

Registration of Aquaculture Societies Regulations 2009

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The Gazette of the Democratic Socialist Republic of Sri Lanka
EXTRAORDINARY
අංක 1601/35 - 2009 මැයි 15 වැනි සිකුරාදා - 2009.05.15
No. 1601/35 - FRIDAY, MAY 15, 2009
(Published by Authority)

PART I : SECTION (I) — GENERAL

Government Notifications

L.D.B. - 2/99.

THE NATIONAL AQUACULTURE DEVELOPMENT AUTHORITY OF SRI LANKA ACT, No. 53 OF 1998

REGULATIONS made by the Minister of Fisheries and Aquatic Resources, under Paragraph (c) of Sub-section (2) of Section 37 of the National Aquaculture Development Authority of Sri Lanka Act, No. 53 of 1998.

FELIX PERERA,
Minister of Fisheries and Aquatic Resources.

Colombo,
12th March, 2009.

Regulations

1. These regulations may be cited as the Registration of Aquaculture Societies Regulations, 2009.
2. The provisions of these regulations shall apply to all licensed Aquaculture Societies operating in Sri Lanka on the date of the coming into operation of these regulations.
3. (*a*) Every licensed Aquaculture Society operating in Sri Lanka shall apply to the Director General for registration with the National Aquaculture Development Authority of Sri Lanka.

   (*b*) The Director General shall upon registering such Societies issue a Certificate to each Society confirming the services. He shall also maintain or cause to be maintained a Register of all Societies which have been so registered.
4. In these regulation—

   "Aquaculture Society" means any society or committed established for the purpose of undertaking any activity connected with the sustainable development of aquaculture ;

   "Aquaculture" shall have the same meaning as in the Fisheries and Aquatic Resources Act, No. 2 of 1996 ;

   "Director General" means the Director General of National Aquaculture Development Authority of Sri Lanka appointed under Section 13 of the National Aquaculture Development Authority Act, No. 53 of 1998.

05-596

Brackish Water Shrimp Hatcheries (Issue of Post Larvae) Regulations of 2010

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The Gazette of the Democratic Socialist Republic of Sri Lanka

EXTRAORDINARY

අංක 1677/7 - 2010 ඔක්තෝබර් 25 වැනි සඳුදා - 2010.10.25

No. 1677/7 - MONDAY OCTOBER 25, 2010

(Published by Authority)

PART I : SECTION (I) – GENERAL

Government Notifications

L.D.B.–2/1999.

NATIONAL AQUACULTURE DEVELOPMENT AUTHORITY OF SRI LANKA ACT, No. 53 OF 1998

REGULATIONS made by the Miniter of Fisheries and Aquatic Resources Development under section 37 of the National Aquaculture Development Authority of Sri Lanka Act, No 53 of 1998.

RAJITHA SENARATHNE
Minister of Fisheries and
Aquatic Resources Development

Colombo,
13th October 2010.

Regulations

1. These Regulations may be cited as "the Brackish Water Shrimp Hatcheries (issue of Post Larvae) Regulations of 2010".

2. No person shall issue or transport Post Larvae from Brackish Water Shrimp Hatcheries, or stock in culture ponds, cages or pens, except under authority of a license issued in that behalf by the Director - General of National Aquaculture Development Authority of Sri Lanka (hereinafter referred to as the Director-General).

3. Every application for a license under regulation 2 shall be made to the Director - General substantially in From "A" set out in the Schedule hereto and shall be accompanied by a fee of rupees one thousand. The Director - General may where necessary require an applicant to furnish further information.

4. The Director -General shall, on consideration of the matters contained in the application and information, if any either issue a license for the issuance or transportation of Post Larvae from Brackish Water Shrimp Hatcheries, or stock in culture ponds, cages or pens or for reasons to be recorded by him refuse to issue a license. The Director -General shall in writing inform the applicant of his decision and in a case of a refusal to grant a licence, he shall state him reasons therefore.

5. Every license issued shall be substantially in Form "B" set out in the Schedule hereto and such license shall, unless revoked earlier, be valid for a cultivation cycle declared by the cultivation time table from the date of issue and shall be subject to such terms and conditions specfied therein.

6. The Director -General may revoke a license issued under regulation 4, if he is satisfied that the licensee has violated any of the terms and conditions of such license.

Expansion of Shrimp Farming

A. Zonal Plans for Batticaloa and Trincomalee

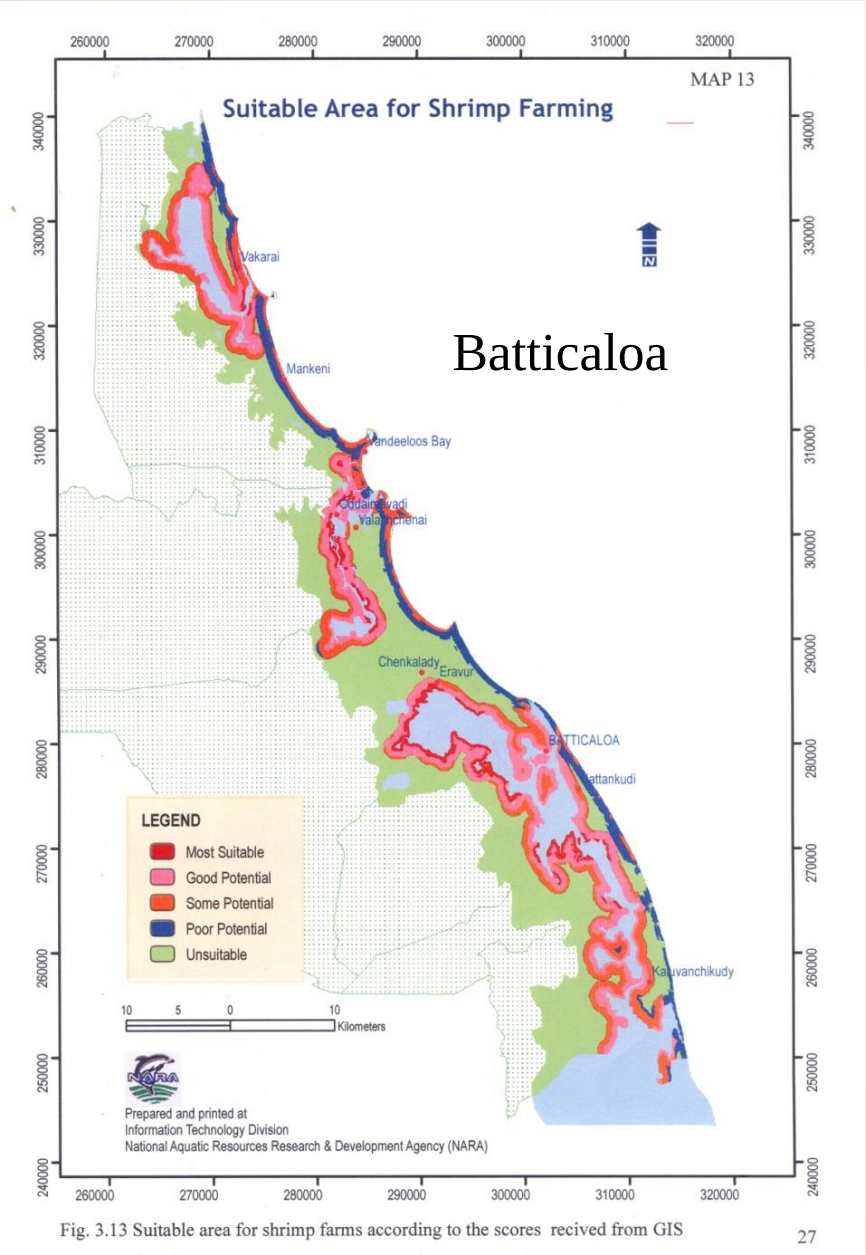

Fig. 3.13 Suitable area for shrimp farms according to the scores recived from GIS

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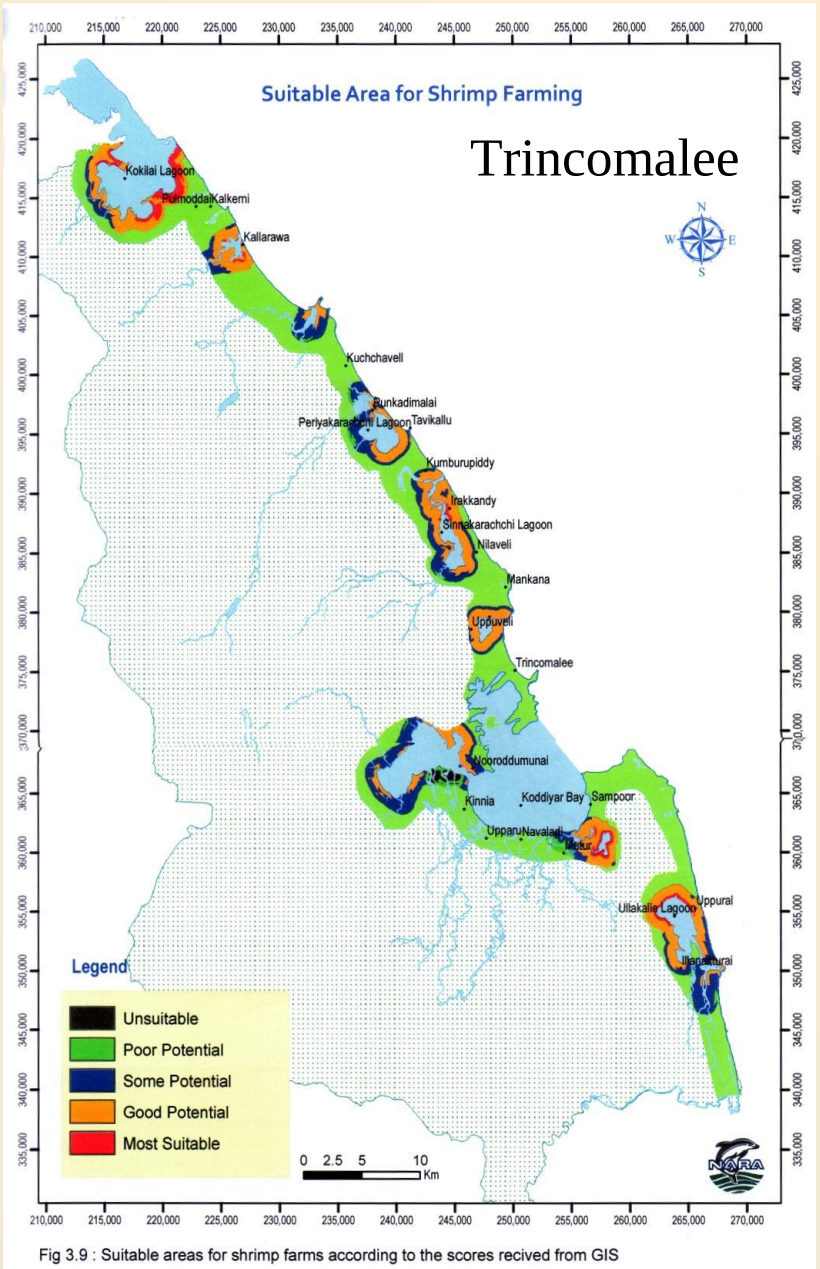


Fig 3.9 : Suitable areas for shrimp farms according to the scores recived from GIS

B. Establishment of a Shrimp Hatchery, Putthukudiriuppu Batticaloa

Year	Hatchery Production (Mn)
2011	9.68
2012	30.42
2013	35.00
2014	20.45
2015	20.99

C. Demonstration Shrimp farm, Batticaloa

D. Cluster shrimp faming in Vakerai

Shrimp production

2012 – 31.80 Mt

2013 – 81.95 Mt

2014 – 92.21 Mt

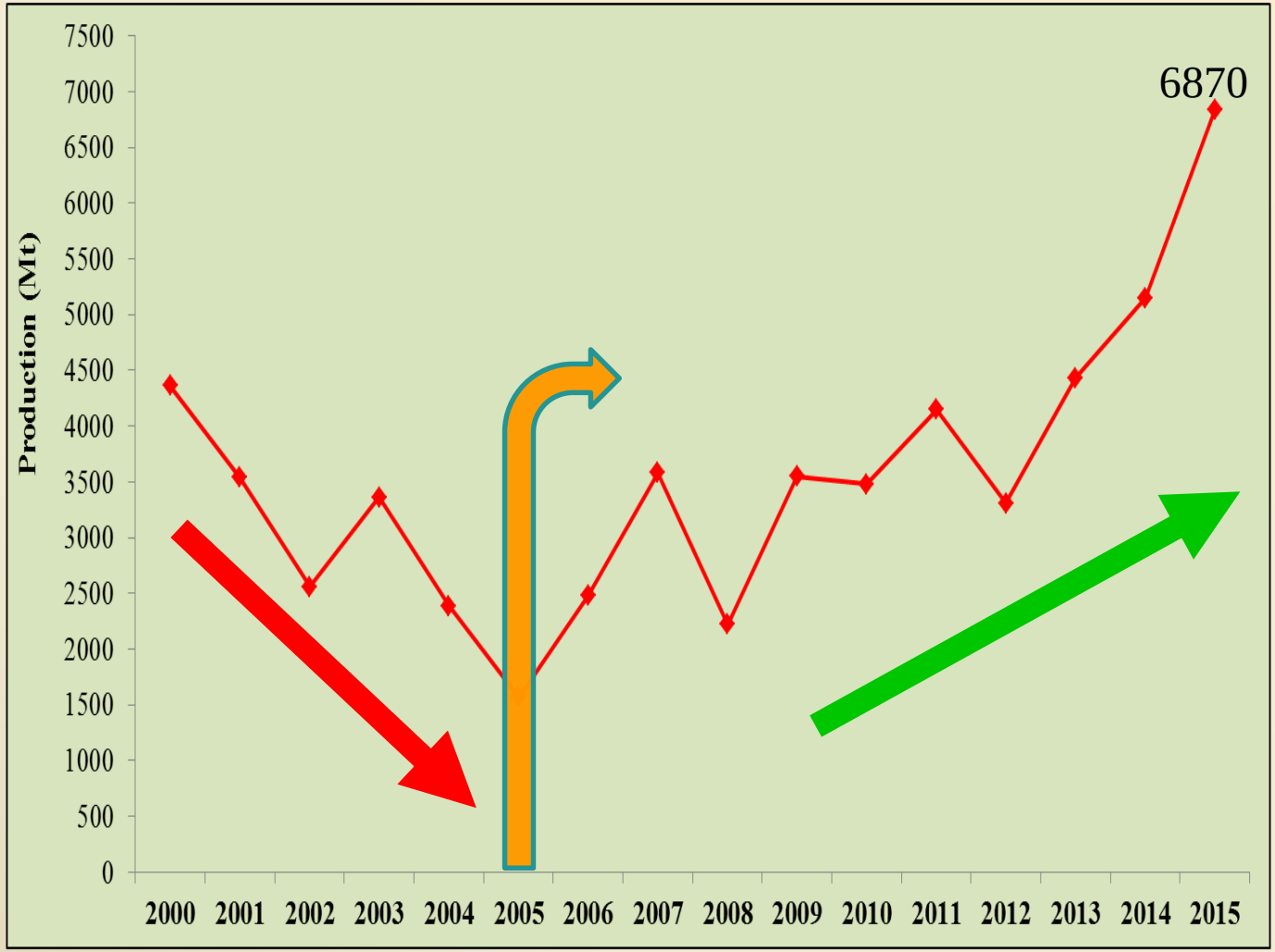
2015 – 96.87 Mt

Present status of shrimp aquaculture industry in Sri Lanka

Shrimp Farming Area in Puttalam and Batticaloa

Year	Area (ha)
2005	696
2006	1137
2007	1505
2008	1098
2009	1386
2010	1240
2011	1641
2012	1544
2013	1695
2014	2081
2015	2164

All these stratergies supported to increase the shrimp production



Shrimp Exports

Year	Quantity (Mt)	Value (Rs.Mn)
2000	4855	5041
2001	3941	4300
2002	3368	3286
2003	4467	4165
2004	2462	2359
2005	1800	1769
2006	1837	1987
2007	2023	2487
2008	854	1082
2009	1432	1627
2010	1262	1521
2011	1380	1799
2012	1056	1618
2013	1625	2521
2014	2001	3375
2015(Up to Nov)	1190	1776

Future Developmets

- **Establishment of Aquaculture Industrial Parks**

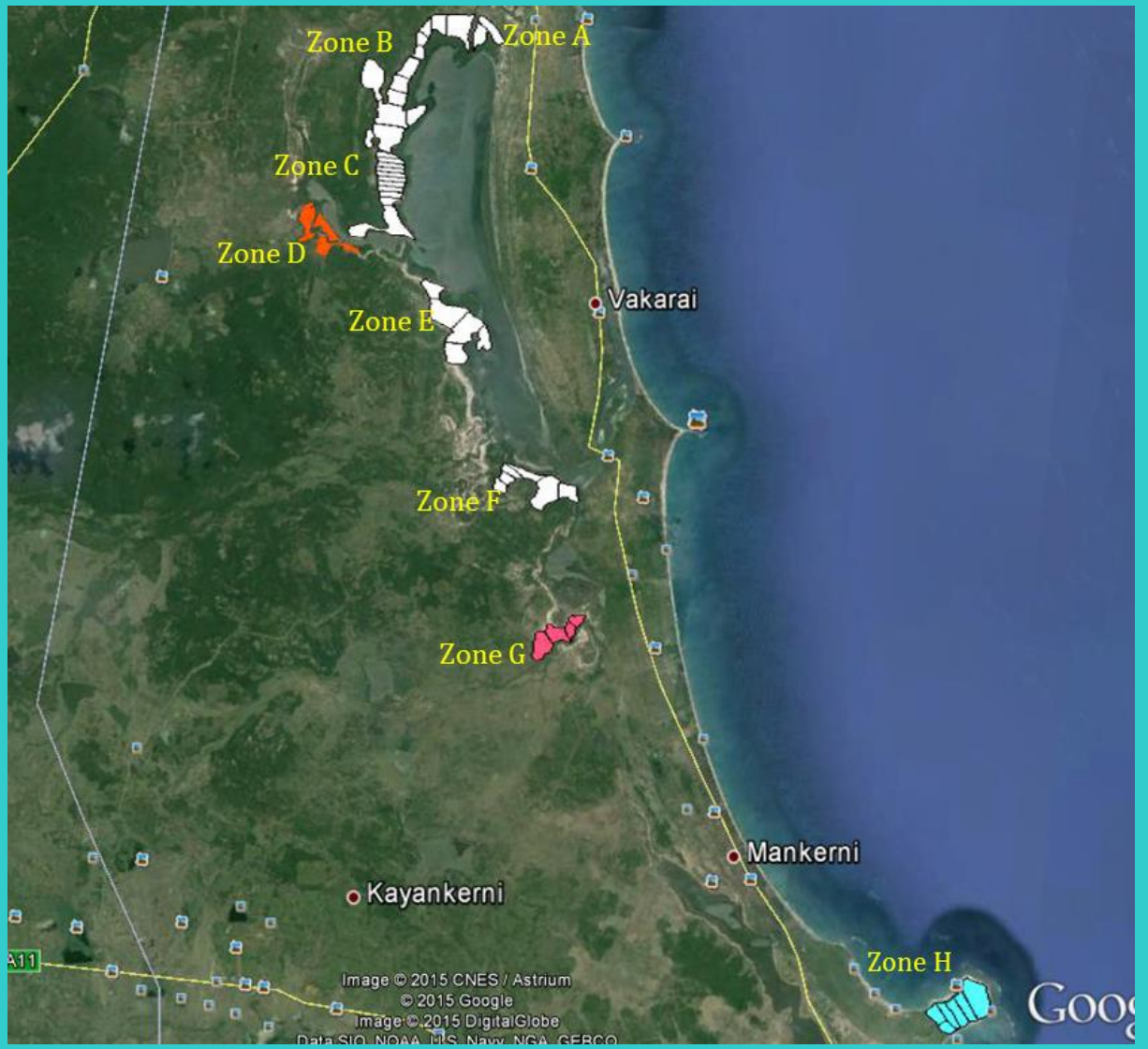
Proposed land area is around 1110 ha in Batticaloa District

Shrimp Farming

Sea Farming

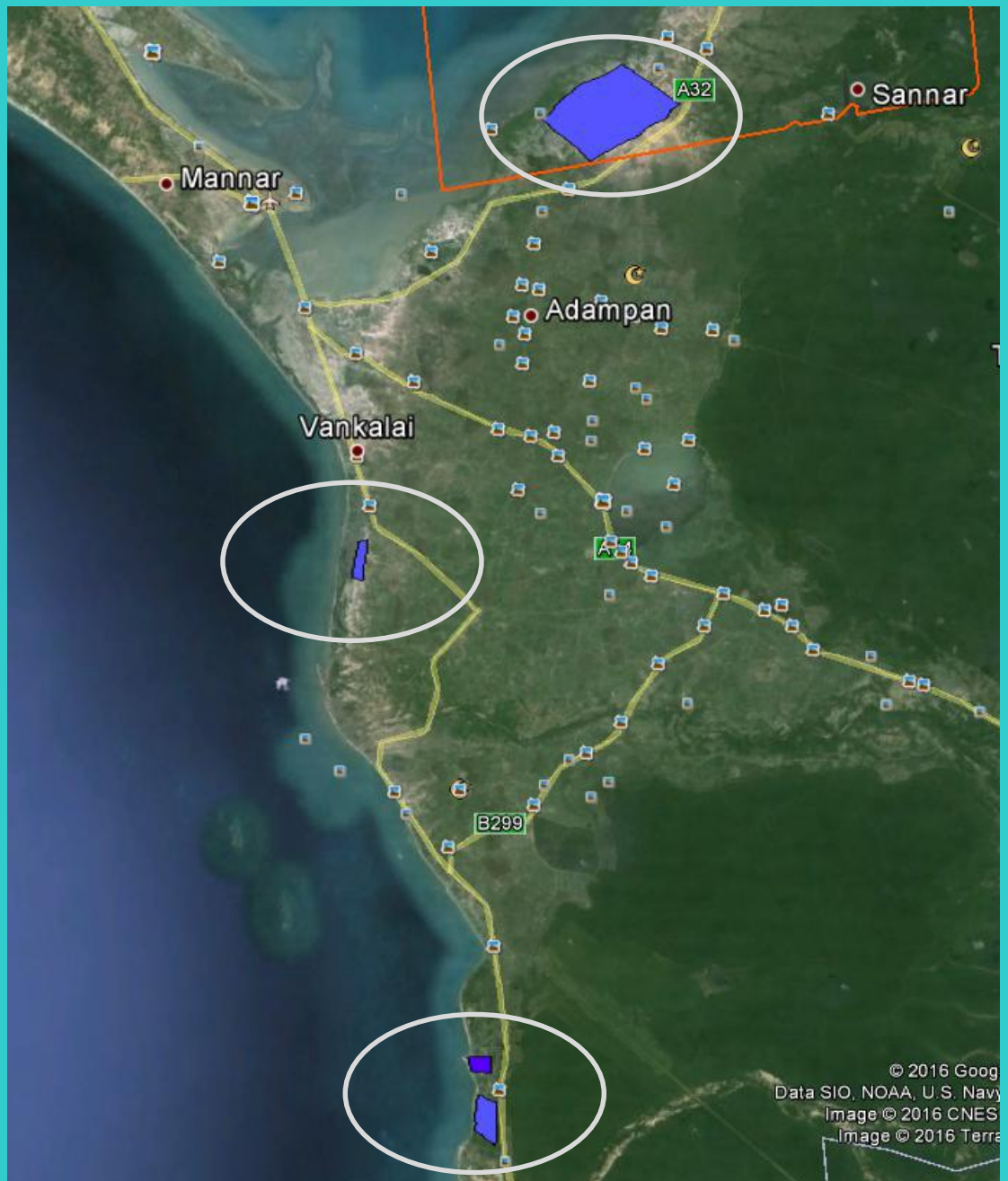
Fish Culture

Crab Farming



“I also propose to set up an Aquaculture Park in Batticaloa District by providing an enabling environment for the potential private sector investors to develop coastal aquaculture without causing environmental degradation. Aquaculture Park provides an 'investment ready' platform for organizations that want to set up commercial quaculture operations. This Aquaculture Park will be developed and managed as a PPP. I propose to allocate Rs 100 million for the initial activities."

Proposed land area is around 1500 ha in Mannar District



Objective

To improve the environment for aquaculture investments and sustainably meet food security and economic development targets without causing environmental degradation by providing suitable environment for the potential investors to develop coastal aquaculture

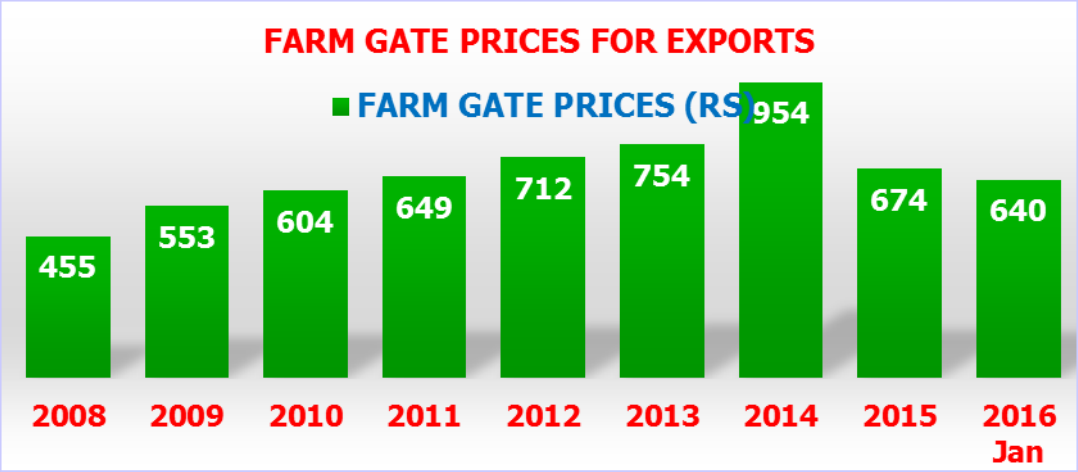
Out puts

- Increase aquaculture production
  9500 Mt
- Direct and indirect jobs
  8000
- Increase income
  Rs. Mn 7000

- **Establishment of shrimp nauplii production and distribution centre, Indeewari farm**

Issues

- Although shrimp production is sustained at satisfactory level at present shrimp prices of the export market has been dropped.
- Shrimp Feed price increased.
- Production Cost increased



Loan Scheme proposed in the Budget 2016 for Development of Shrimp Aquaculture Industry

"The Shrimp industry has been faced with difficulties in the immediate past which has remained unattended. However, given the potential in the shrimp industry I propose to provide capital and working capital requirements of the shrimp farmers, hatchery operators and processors through the proposed ADB supported SME credit line. I also propose to provide guarantees through the SME credit guarantee fund to those who are engaged in shrimp farming."

Proposals for Loan scheme

- Capital Investments for New Shrimp Hatcheries and upgrading existing hatcheries
  - *Maximum Capital Investment –Rs. 100 MN*
- Working Capital for Shrimp Hatcheries
  - *Maximum Working Capital (per annum) - Rs. 30 MN*
- Capital Investments for New Shrimp Farms excluding in NWP and upgrading existing farms to intensification
  - *Maximum Capital Investment –Rs. 150 MN*
- Working Capital for Shrimp Farms
  - *Maximum Working Capital (per annum) - Rs. 30 MN*

- Alternative Species Culture in Shrimp Ponds
  - *Maximum Capital Investment –Rs. 120 MN*
- Processing Plants

  Loan for Capital Expenditure.
  - This should be given for purchase of machinery and also construction of factory buildings. This is process of value addition.
  - 50% of the amount to be given as a grant and the balance as a soft loan to be repaid in 5 years or more.
  - Loan to be given in US$.
  - Maximum amount per company should be US$ 1 Million.
  - Increase of cold room capacity specifically to stabilize prices during the time of excess harvest reaching the Colombo fish market to safeguard the international prices..
  - Also to processes to hold the stock during the times of international market price instability.

- Processing Plants

  Loan for working Capital

  - To be given as a revolving Credit line to be repaid within 6 months. This is for purchasing of raw shrimps from the farmers
  - Maximum amount per company should be US$ 1 Million.
  - To be given in US$ with an interest rate of 2%.
  - Interest to be paid monthly.
  - Proposal for repayment of the total amount should be 1% of the turnover as a cash build up and to be repaid in 2 years.
  - The above facility to be restricted to 7 current Shrimp Processing plants presently in operation.
  - Facilities to be given through Bank of Ceylon.
  - There should not be restrictions on companies with foreign shareholding

Proposal for Upgrading Shrimp Aquaculture in Sri Lanka through Government Direct Intervention

- NBT and PAL *(The waiver of these taxes will result in a direct saving in cost of production as prawn feed represents 50% in cost of production which will benefit the farmer directly and it will provide a relief to the farmers.)*
- Cluster Shrimp Farm Development
- Implementation of Incentive Scheme for Farmers who Sale their Product to the Export Market
- Introduce a Subsidized Rate for Electricity Supply
- Permit *Penaeus vanamei* Farming in the Aquaculture Industrial Park, Batticaloa.

Thank You