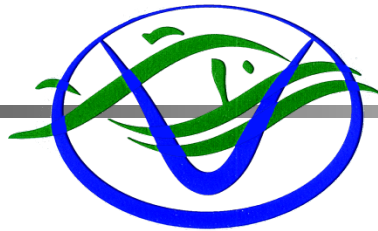


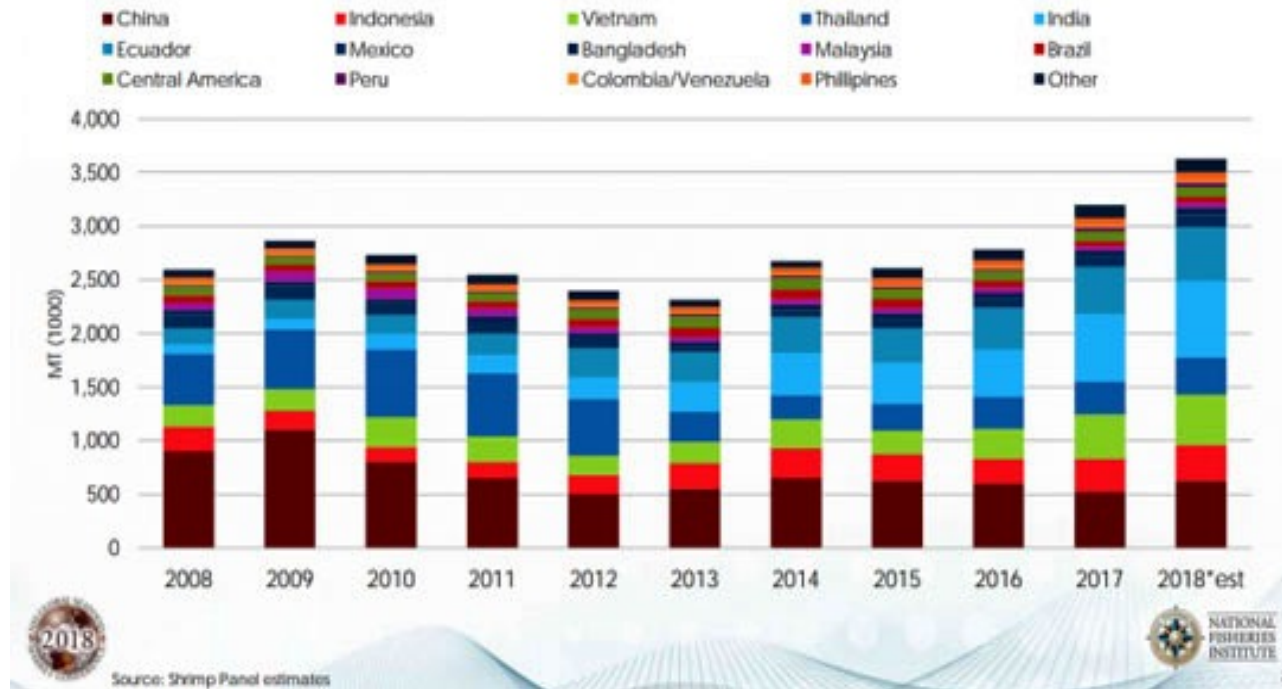
**The changing face of
shrimp aquaculture in India**



**Ravi Kumar Yellanki
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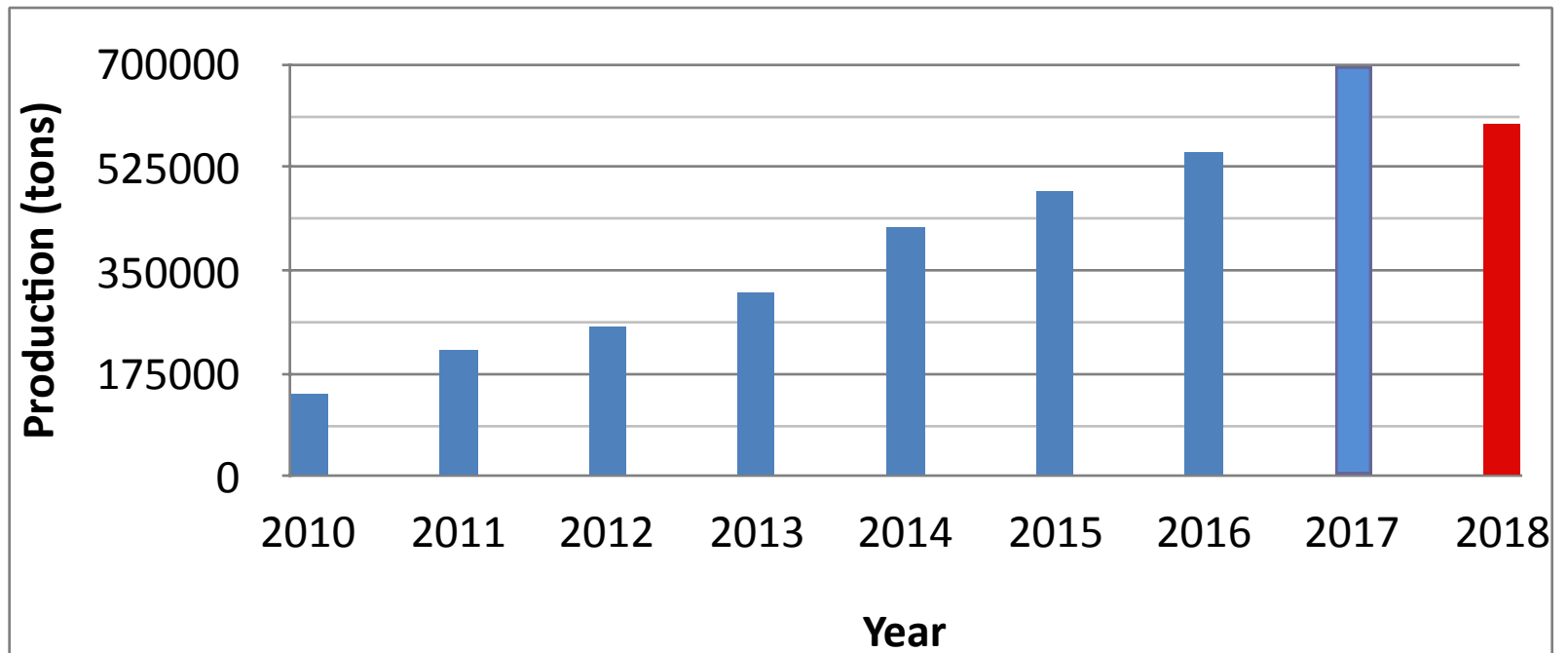
Global Farmed Shrimp Production

Global farmed shrimp production





Indian Shrimp Production

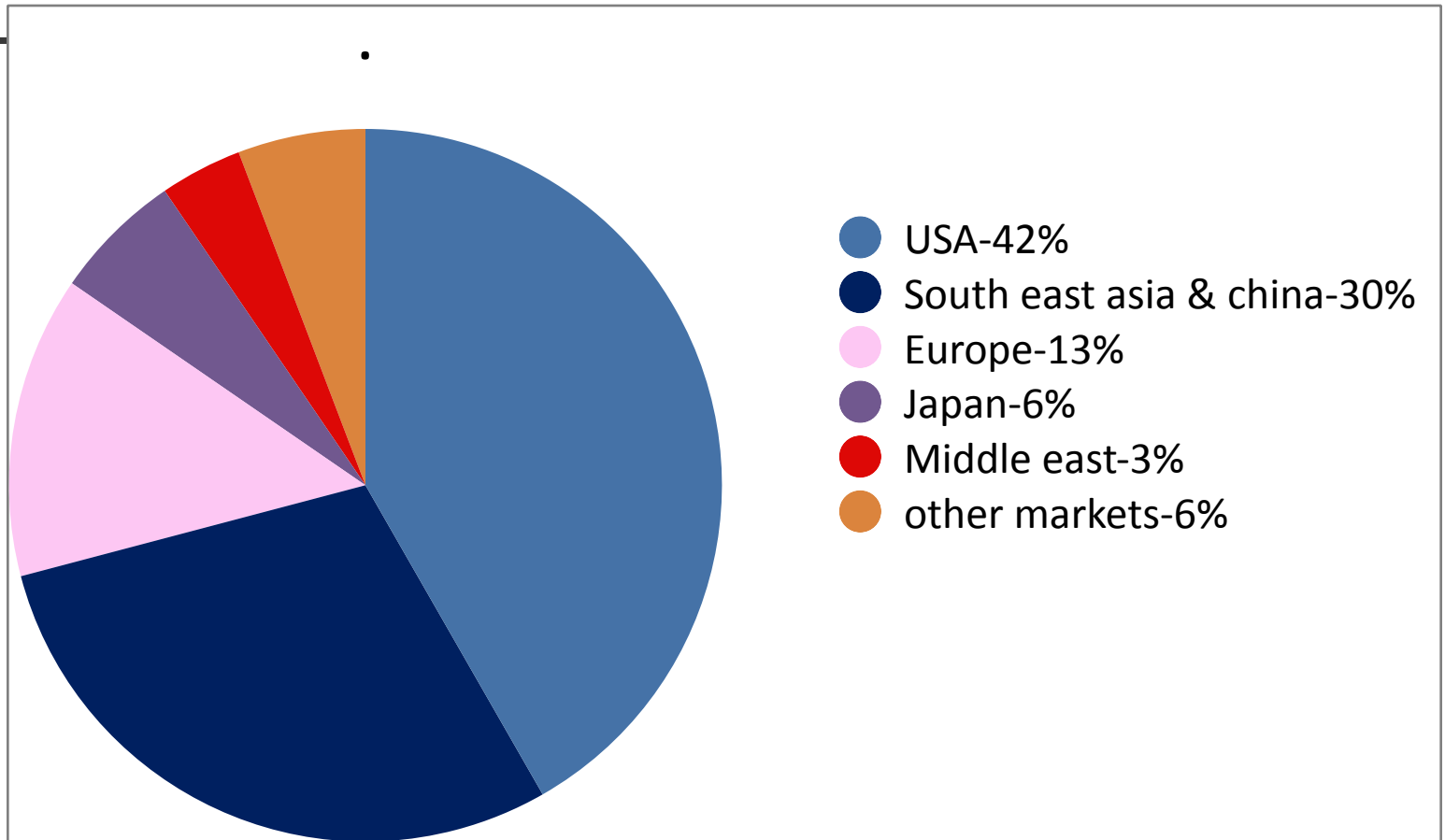




Farmed Shrimp Market

Supply	MT	Demand	MT
China	700,000	China	1,200,000
India	510,000	US	664,000
Ecuador	460,000	Europe	547,000
Vietnam	390,000	Japan	160,000
Indonesia	360,000	Korea	50,000
Thailand	260,000	Canada	40,000
Mexico	120,000	Taiwan	36,000
Central American Countries	110,000	Russia	27,000
Bangladesh	100,000	Chile	25,000
Brazil	70,000	Australia	15,000
Philippines	60,000	Singapore	10,000
Malaysia	50,000	Rest of the World	416,000
Total	3,190,000		3,190,000

India Shrimp Export basket 2017-2018





Indian Shrimp Exports During 15-18

Country	15-16 (MT)	16-17 (MT)	17-18 (MT)
USA	134,143	165,827	212,780
South East Asia	65,187	105,763	138,085
EU	81,849	77,178	69,899
Japan	34,204	31,284	30,038
Middle East	17,476	19,554	19,062
China	9,541	7,818	10,723
Other Markets	31,463	27,063	29,572
Total	373,866	434,487	510,159



EU Market

- It is coming down by the year.
- EU has increased the sampling to 50% from 10% last year.
- Instant ban – delisting.
- Most of exporters are shying away from exporting to EU.



Measures implemented

- Change of business process.
- Increased monitoring.
- Sensitizing the operators through out the value chain.
- Legal frame work- punitive action by government.

Sensitization programs for hatcheries by SAP





Markets and penetration

- Regular exports to EU have to be resumed.
- Need to work on new markets as one of the leading producers.
- Exporters need to move up the value chain – value addition.
- Needs to establish domestic market to be more stable even when global markets are down.



Positive indicators for domestic market

- GDP growth of 7% to 8% - rising income levels.
- Demographics – 1.32 billion population and 65% of it is below 35 years of age.
- Growing health consciousness.
- The present domestic market consists of wet markets and frozen shrimps in retail market which is very small- scope for several new segments like selling fresh shrimps in markets of vicinity.



Cold Chains

- Highly inefficient supply chain – lack of cold chain infrastructure.
- Cold Chain needs to start at the farm level and cover up to consumer level.
- Not many multinational companies have entered the food value chain.
- There is no single billion dollar company in food industry in India.
- Government has accorded high priority to establishment of cold chains.



Retail

- One of the largest sectors in global economy – USD 22.5 trillion.
- Size of Indian sector - \$ 600 billion.
- Organized sector – 4%.
- A strong retail sector can give fillip to food processing sector.
- Indian retail sector is least saturated and less competitive.
- As of now, 100% FDI is not allowed in multi-brand retailing.



WSSV

- Single largest contributor for failures.
- Industry has never seen this kind of wide spread white spot outbreaks through out the country.
- It is not vertically transmitted as the industry is completely dependent on SPF broodstock.
- There is no respite for stocking – continuous in terms of space & time.
- In no other shrimp farming country, WSSV is as rampant as it is in India.



Bio security in farms

- Per capita land holding is small in most shrimp farming pockets of the country.
- Where ever per capita land holding is high, WSSV out breaks are less.
- Lack of awareness and poor implementation among the small farmers is another reason.
- The probability is also high if you have more number of operators.



Per capita land holding vs Productivity

Location	Per capita land holding ha	Seed stocked (2017) Millions	Production (2017) MT	Productivity in terms of seed (production MT per million seed)
Gujarat	About 10	2500	51,000	20.4
Rest of the Country	Around 2	47,600	488,000	10.25

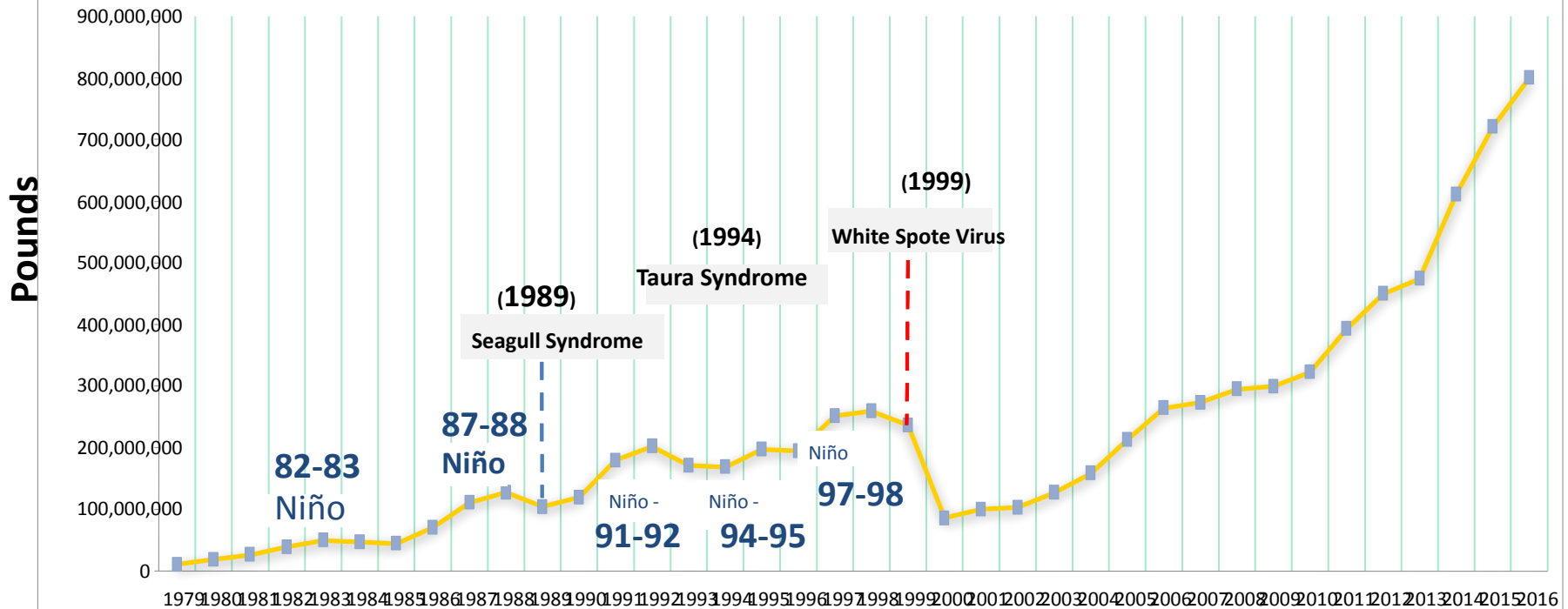


Solutions for WSSV

- Crop holiday in Oct, Nov & Dec - Possible
- Area specific crop holidays - Probable
- Specific tolerant stocks for WSSV - Plausible

Ecuador-The case in point

Ecuador: Shrimp production and trade (1979 -2016)





EHP, White feces & Running mortality syndromes.

- White feces looks to be very threatening.
- Running mortality syndrome looks to be more pronounced in summer
- As of now, both are idiopathic.
- EHP is a parasite with complex life cycle.
- EHP is possibly not associated with white feces.
 - Shrimp samples with white feces are showing EHP positive.
 - Not clear if there is any linkage



Tolerant stocks for bacteria

- Breeding companies need to work on resistant stocks for bacteria.
- Apparently some companies already have stocks resistant for bacteria.
- This could help both hatcheries & farms.
- Could help farmers in combating white feces and running mortality syndromes.

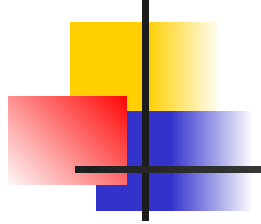


Change of practices in farming

- The thrust of the farmers is on suppressing the bacterial loads.
- Clean Post larvae, clean water and clean pond bottom are helping the farmers in reducing the bacterial loads – right hatchery protocols, different water treatment methods, central sludge removal pit.
- Nurseries are coming in handy.
- Few farmers are stocking tilapia in reservoirs
- Reduction of densities and shortening the crop.

Nursery with lined ponds





Nursery with canvas tanks





Measures taken to control EHP in farming

- Post larvae is being tested at the hatchery and juveniles before shifting from nurseries.
- For earthen ponds affected with EHP, CaO (quick Lime) is applied at 6tons/ha.
- For lined ponds, 2.5% NaOH solution is applied and washed off after 3 hours of contact time. Then the ponds are dried for one week before getting rinsed with 200ppm chlorine solution.
- Some of the farmers are leaving half of their ponds for sedimentation and water treatment.
- During the course of the crop, partial harvest along with good water exchange is helping at times.



Change of protocols in hatcheries

- Thorough rinsing of eggs & Nauplii.
- Change in disinfection procedures of maturation.
- 2.5% NaOH solution is applied and washed off after 3 hours of contact time. Then the tanks are dried for one week before getting rinsed with 200ppm chlorine solution.
- Hatcheries are doing away with usage of live feeds.
 - Live feeds are pasteurized or frozen
 - Imported frozen SPF polychaetes are also used
- Larval rearing – modular operation and swift stocking.
- Antibiotics are completely done away with.



Room for improvement of feed quality.

- High FCRs are not helping the farmers to control the organic and bacterial loads.
- Apparently the feed formulation is compromised.
- A well formulated feed could cost more but help farmers in getting better FCR and good crop.
- Few feed mills have started offering functional feeds –the results are quite encouraging



Traditional tide fed farming

- About 60,000 ha of farming is there.
- Production is only about 15000 tons – 20,000 tons.
- Over all survivals are well below 25%.
- Vannamei introduction is not possible
 - No bio security.



Role of Temperature

- Global warming – water temperature in most of the culture areas is going up to 37 °c leading to morbidities and mortalities.
- When temperature is above 34 °c feed gut passage time is less than 45 minutes – contributing to more organic load.
- Running mortality syndrome in vannamei could be because higher temperature.
- Running mortality syndrome is apparently not reported in monodon culture.



Temperature vs Productivity

- Usually the survivals in summer months are better off in Gujarat than AP and TN as the temperatures are relatively less in Gujarat.
- But this year Gujarat temperatures are unusually high and the farmers there have taken a huge beating.
- White feces issue also looks to be more prominent in summer months contributing to lower productivity



Domestication of indigenous species

- Gives an opportunity for traditional farmers – tolerant stocks could further help.
- Indicus & merguensis can be easily domesticated- not an onerous task.
- Though monodon domestication is difficult; it gives an enlarged market opportunity.
- Could as well help small farmers in semi intensive belts.
- Gives farmer a better chance to combat diseases.
- Could do well during summer as well.



Domestication programs of monodon

- Moana Technologies, Hawaii.
- Aqualma, Madagascar.
- C.P.F, Thailand.
- CSIRO, Australia.
- R.G.C.A, Andaman, India.



Domestication of Indicus & merguensis

- Whole of middle east used to depend on indicus – now they switched over to vannamei.
- Farming in middle east did not fail because of species ; it failed because of bio security lapses and inadequate technology in their breeding programs.
- Domestication in merguensis is well established in Australia.
- It could take time to come up with fast growing lines in these two species; till then they can be used for tide fed farms where there is no feed usage.



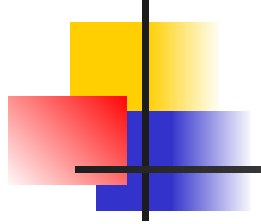
Who should work on these programs ?

- Government – Central & State.
- Feed mills
- Hatchery consortium.
- Large integrated companies.
- Existing breeding companies



Conclusion

- It is about time to go for changes and innovations in all segments right from broodstock to markets including feed to help the Indian shrimp industry stay on the growth trajectory and continue to dominate the global markets.



Thank You....