



Future of Vannamei

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Story of this topic-

Vannamei culture cum business industry standing in a critical position. Presently Ecuador produce huge production & they export to all over the world in the cheapest rate. Post Covid-19 situation every country are suffering their financial strength. Our vannamei demand very slow. I hope that this topic very helpful to all farmers, businessman, vannamei's greedy eater persons (who has involved with the vannamei). I point out any moment, it will be rescued the vannamei industries.

I hope another business policy will develop for sustainability the vannamei industry. **Now require looks at the situation as per guideline & all time involve with vannamei.**

Abstract-

Aquaculture is now more profitable business within a short time. These businesses help the best impact in socio-economic condition. Vannamei culture is now a very profitable business within a short time with help for good employment chances.

RM rate not possible to increase the profit margin for farmers.

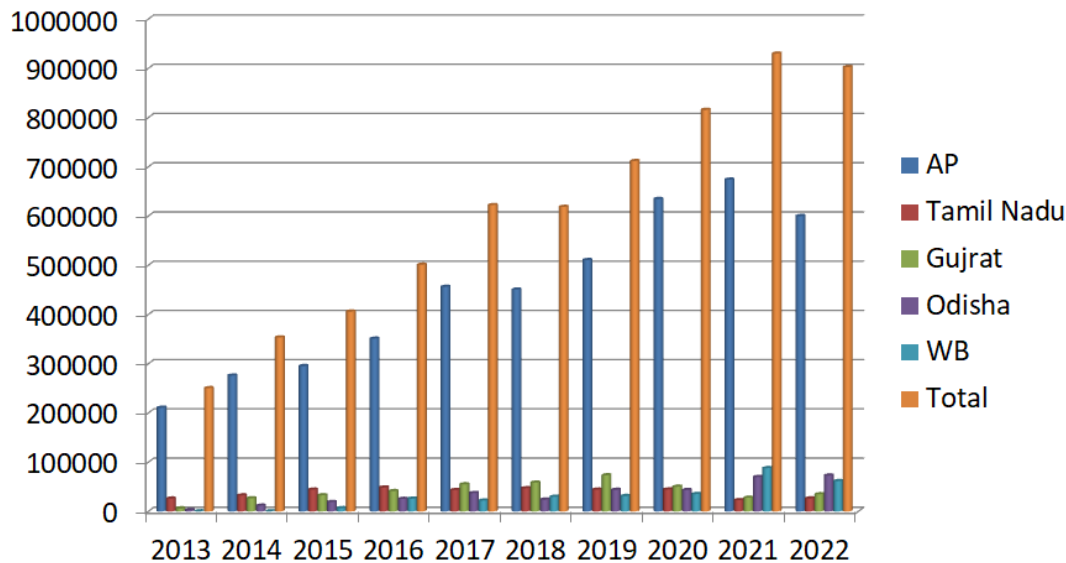
Maximum countries have huge production & they supply to all over world in the cheapest rate. Global factors bad impact of economic condition in post covid situation of importing countries.

Now business policy is reflected for sustainability in problem situation.

Now challenge for Vannamei sustainability-

- 1) **Production cost increase**
- 2) **Vannamei Price**
- 3) **Export**
- 4) **Disease**
- 5) **Farm Management**
- 6) **Environment**
- 7) **Weapons war**

State wise Vannamei Production



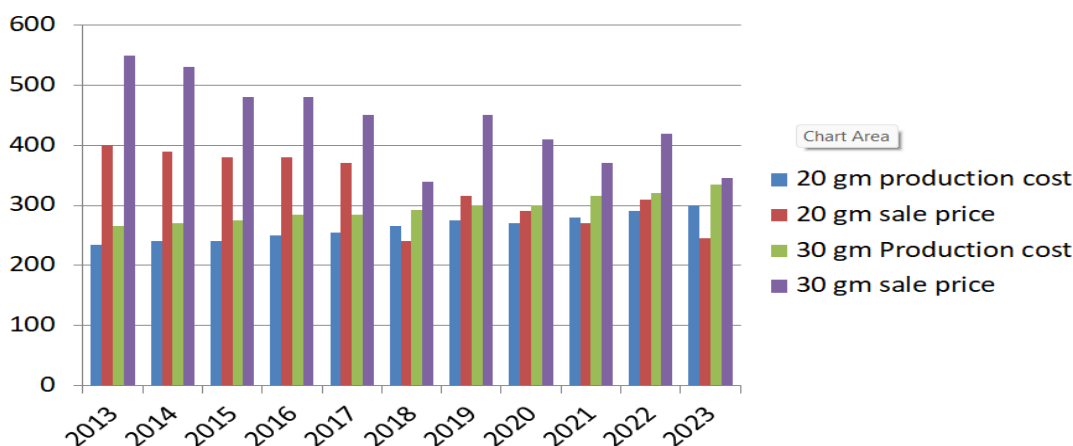
Main problem for vannamei culture cum business-

- 1) **Certification Problem**-Maximum farmers are not registered their farm, they have not maintained traceability for export. It is now bad impact of export. The BAP & ASC certificate is now mandatory for the better exporting system.
- 2) **Not improve infrastructure**-Farmers are not improving biosecurity, aeration system, treatment for water exchange, sludge remove etc.
- 3) **Seed issue** –Maximum hatcheries are purchasing less quantity of brooder from RGCA but more PL sale to farmer's .The broker has supplied duplicate seed of reputed hatcheries name.
- 4) **High Temperature**-Water depth require for ponds due to in bacteria growth found in high temperature & physical stress found in the summer.
- 5) **Efficacies of AHCP, Feed etc.**-Maximum farmers don't know which AHCP best efficient in critical condition. Feed's ingredients are not helping proper digestion.
- 6) **Experience of feed monitoring**-Lack of experience for proper feed monitoring in adverse condition.
- 7) **Environmental condition**-Environment influences the feed digestion, also improved the secondary disease
- 8) **Cultural problems, lack of proper knowledge**-Farmers are facing many critical diseases out of their knowledge.

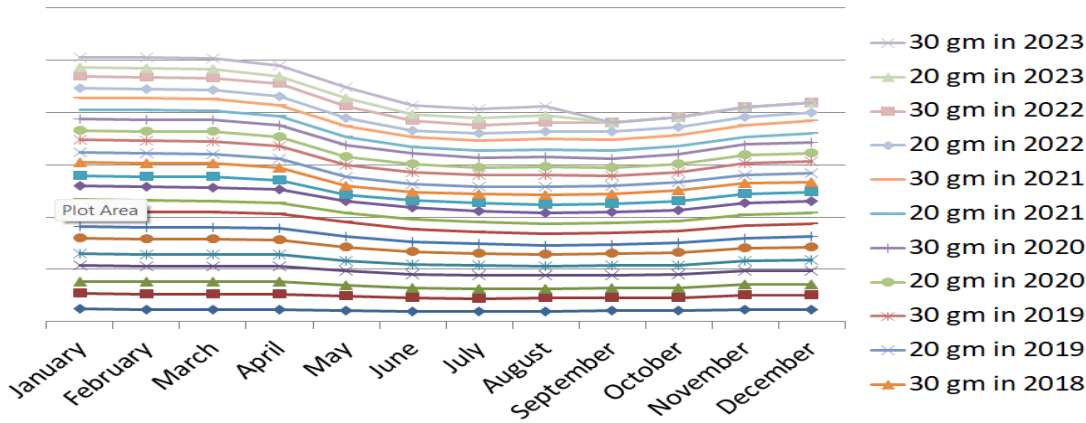
- 9) No interests developing farm-** Maximum farmers are not implementing new technologies in his farm for better production & reduce the chances of damage.
- 10) Decrease of production in the same area-** Comparatively we see that production of materials growth decrease from 1.5-2 gm in every year at the same area, same DOC, same S/D & may be same condition.
- 11) Greedy farmer-** Some farmers feel that they earn huge profit from the less investment, also lack of their proper knowledge.
- 12) Strength of farmer's ability –** Farmer's financial strength require due to the capable for managing any situation.
- 13) Educated farmer-** Educated farmers require this sector for implementing new technology for better production. They Conesus about on critical disease & how can overcome critical situation.
- 14) Production cost increase-** Production cost are increasing in every year of lease, labour, fuel or energy, feed, seed, AHCP etc .
- 15) Conesus on high mortality disease-** Vannamei are very less resistant power in adverse condition, may be huge losses from high mortality disease.
- 16) No electric facility –** Government not inspire to farmer for electric facility.
- 17) Require government's steps-** Government can help the fishery sector. The subsidy plan helps to infrastructure .Government help for diesel subsidy for reducing production cost. Ecuador government helps to farmer.
- 18) Availability of good product-** Maximum dealer, agent or sub agent is interesting for business, not for culture. May be they have not choice CAA approved product.
- 19) No treatment after harvesting of water-** Bad habit of maximum farmers is direct discharged polluted water to canal or river. Another sensitive secondary disease will increase & spoil the vannamei culture.
- 20) Lack of efficient labour-** Maximum farmers is sicking skilled labour for properly feed spread or medicine dosing.
- 21) Credit facility-** Slowly spoiled the shrimp industry. Maximum farmers are purchasing materials with maximum credit rate, they have not developed farm infrastructure as per their ability. Some farmers not back the credit amount to the lender persons.

- 22) Export disturbs-** Maximum shrimp industry is now depending on export, export countries have not increased the materials demand .
- 23) Government can negotiation of export-**Government's involvement requires direct negotiation with another country for exporting purposes. Ecuador government helps for negotiation with China.
- 24) Antibiotics issue-**Export countries have restricted antibiotic of materials, but some farmers are misusing antibiotic to culture shrimp. It will be bad impacted for purchase materials.
- 25) RM price less in pick harvest time** –In a pick harvest time RM lifter reduces rate due to lifter have not demanded materials in this period.
- 26) Minimum fixed rate require for RM price** –Require the minimum fixed price for not hit the production cost, but now RM price depending on export countries.
- 27) Global Factors-**Post covid situation is now hampering the business chain. Every country has not recovered properly financial strength. The pre covid situation was better founding profitable condition. Also, Ukraine war is now hampering business chain.
- 28) Lack of a business chain maintains** –This business 100% depends on the chain or trust but some greedy persons are breaking the chain or trust.

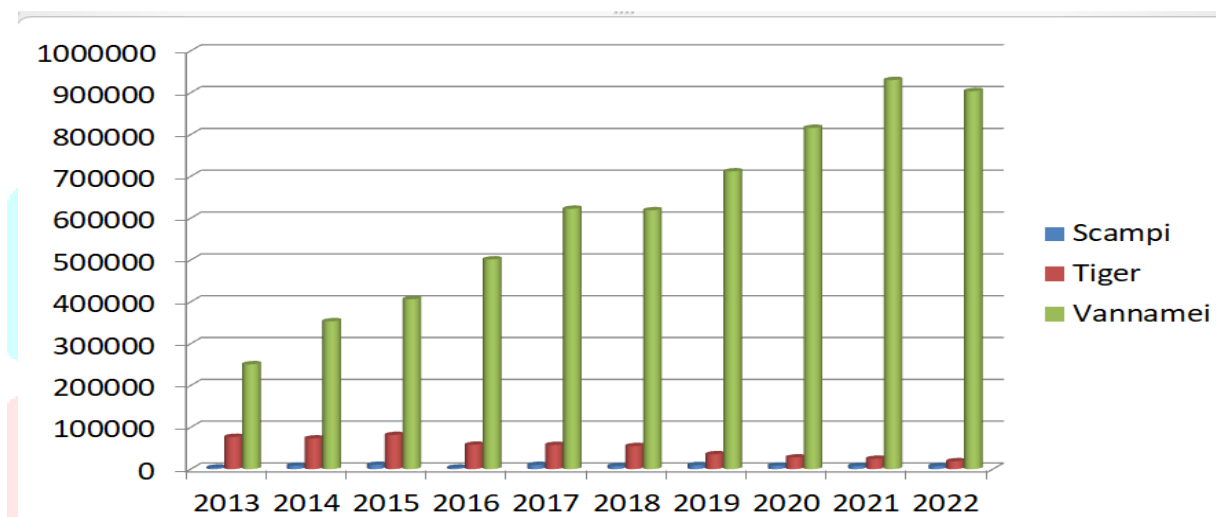
HOVN price vs Production cost in pick harvesting time in West Bengal-



Month wise HOVN price Trend for better crop planning for West Bengal-



Vannamei, Tiger & scampi production in India



Discuss on P.Vannamei species (American white leg species) culture-

Behavior	Advantage	Disadvantage
Stocking Density	Maximum density culture 60 -400 pcs/m ²	High S/D high risk
Temperature	Very high tolerant temperature 15°C to maximum	None
Salinity	Very high tolerant salinity 0-40 ppt culture	None
Growth Rate	Per week growth 1.5 gm to 2 gm upto 20 gm ABW	Growth slow found after 20 gm
Disease Resistance	High susceptibility for various diseases due to very less resistant power.	They can carry any disease
Dietary protein	Protein require 20-36%	None
Brooder	None	High quarantine parcel require
Feed Cost	Dietary proteins require very less (20-36%), so feed cost less than others.	None
Market	Well demand for USA, Asian	Vannamei produced in

Demand	country & European country due to high yield (66-68%)	world wide
Harvesting size	Less ABW (>10gm) can easily sale to local market	>10 gm size not permits production cost.

Discuss on penaeus indicus (Vande Bharat white leg species)

Behavior	Advantage	Disadvantage
Stocking Density	Maximum density culture 30-35 pcs/m ²	Less production than vannamei in same area
Temperature	Desirable for temperature 26-30°C to maximum	High temperature impact for culture
Salinity	Very high 25-30ppt culture	Not good result in <5ppt
Growth Rate	Per week growth 1.0 gm to 1.5 gm upto 20 gm ABW	Growth rate slower 20-25 gm in 90-110 DOC
Disease Resistance	Less chances of WFS	They can carry any disease
Dietary protein	Protein require 25-35%	None
Brooder	Local capture, good advantage of procurement	Chances for contamination & slow growth
Feed Cost	Dietary proteins require very less (25-35%), so feed cost less than others.	None
Market Demand	Well demand for local market & export.	No headache for exporting system
Harvesting size	20 gm to 25 gm	>10 gm size not permits production cost.
FCR	1.42 to 1.66 for 21-23 gm	FCR higher than vannamei
Production in per ha	Maximum production 5-6 ton/ha	Lesser than vannamei

Discuss on penaeus monodon

Behavior	Advantage	Disadvantage
Stocking Density	Maximum density culture 25-40pcs/m ²	None
Temperature	Above 15°C to maximum	<10°C
Salinity	10-15ppt	>26 ppt
Growth Rate	Per week growth 1.5 gm to 2 gm upto 20 gm, then will slow growth.	>30 gm
Disease Resistance	Resistance power more than other species.	None
Dietary protein	Protein require 36-42%	Chances for more toxic gas
Brooder	Local available	Chances for contamination & slow growth
Feed Cost	None	Feed cost high
Market Demand	Well demand for Japan & Asia country due to medium yield (62%)	Less demand
Harvesting size	Above 30 gm	Below 30gm, it now big panic

Require for proper feed ingredients

Product Name	% of require
Fish Meal	22-25% (source of protein)
Fish Oil	2-3% (Source of Essential Fatty Acid)
Premixes	0.1 to 1% for minerals & 0.1 to 0.5% for vitamin
Wheat	20-22% (source of carbohydrate & pellet purpose)
soyabean	40-44%(protein source)

Require of nutrient with feed additive (Good impact of Hepatopancreas)

Require nutrient	High quality imported fish meal, soya bean, yeast, vitamin, lecithin oil
Bile Acid	Protecting liver & promoting fat absorption
Probiotic	Lactobacillus, bacillus, Streptococcus etc
Immune enhancing product	Chromogenic acid, polysaccharides, Glucan, Mannan oligosaccharides, peptidoglycan
Organic Acid	Reduce gut pH & improve digestibility

Advantage & dis advantage of additive product use in feed

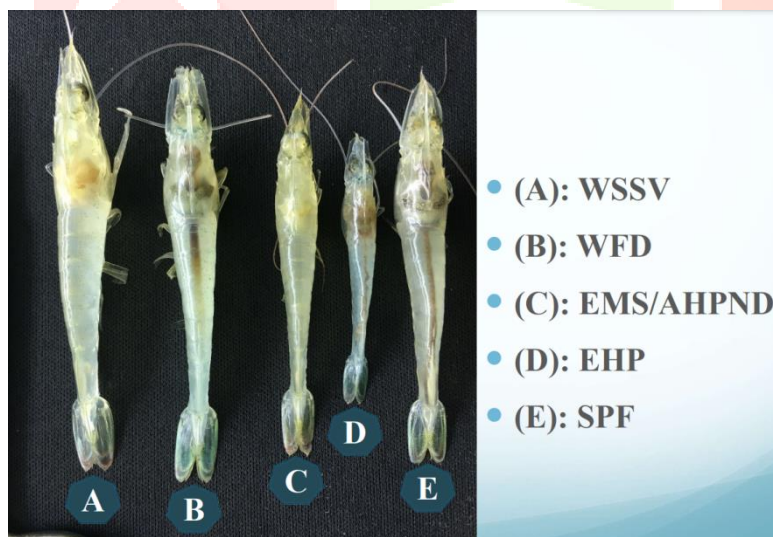
Additive product	Advantage	Dis advantage
Require Nutrient	Basic product require proper composition for good quality feed processing	Improper composition bad impact.
Immune enhancing product	Improving immunity system for resist other pathogen	More use effecting on molting cycle.
Bile Acid	Bile acid 160 mg/kg mix with feed,reduce fish meal 210gm/kg as per require. Protect liver & Pancreas.Also help hepatopancreas activities.	Above 600 mg/kg slowly damage hepatopancreas
Probiotic	Recommended 2-6kg /mt feed	None

Future of Vannamei’s sustainability depend on-

- 1) Improve disease management for better production
- 2) Scope for increase domestic consumption
- 3) Improve business policy

❖ **Improve disease management for better production**

Conesus about on Physical sign of Diseases



Bio Security-



In vannamei culture Biosecurity one of the main tools for successful culture. Properly help from serious secondary disease & maintain to the ecosystem. For biosecurity purpose uses in farm –bird string, carb net, animal net, 100 ppm of PP solution for foot dip, 20 ppm of chlorinated water for hand dip purpose. Foot bath always uses in the main gate of farm for disinfection the vehicles. Periodically bleaching spray outside of farm for reducing the chances of contamination.

Water Treatment Methods-

In the West Bengal culture scenario, we see that river or canal water has high NTU in turbid water. Chances for carry to secondary disease for vannamei culture. It is now mandatory for sediment the turbidity particles.

Small scale farmer maintain this types of water treatment-

First use PAC & PP when water enters in sediment pond. Then flocculants start in quick basis.



Good flocculants found in Zig Zag process-



Then water take into ready to use ponds. Bleaching require for minimum quantities. Lesser chances for carrier of secondary disease in shrimp culture.

Reservoir facility-

- a) The reservoir is now important role for successful farming; water exchange reduces the disease incident & reduce the plankton population
- b) Approx 30% area require for total WSA area.

Water Exchange require for reduce the disease chances-

In close system culture water exchange big help for successful vannamei culture. Vannamei not facing stress, also not found any disease

Water exchange method-

- 1st Month-0.1% per day
- 2nd Month-3% per day
- 3rd Month-5% per day
- 4th Month-7% per day

- **Prevention of dense algal blooms.**
- **Maintain water depth in environment condition for successful culture.**

Water exchange process depends on stocking density

Nursery Pond-

Now a day PE line nursery pond cans big help to vannamei culture. On the nursery pond every week check water parameter as well as shrimp's disease condition. Any disease happens in nursery pond, it can damage instant basis. Not chancing to contamination of the critical disease outbreak into grows out culture ponds.

In nursery system vannamei is founded rapid growth in the grow out pond.

Proper Stocking Density

It now depends on proper pond management capacity. Maximum farmers are Conesus about on pond carrying capacity & depending on size of market demand. The farmers are choosing semi extensive, Intensive & super intensive stocking density.

Seed Selection & Stocking time-

Seed selection one of the vital role of successful culture. Seed purchase from CAA & BAP certified hatchery due to the properly maintains good production. PCR test report require from standard quality lab. Proper salinity,pH & temperature acclimatization require for seed stocking time. Best time for seed stocking before 7am or after 6 pm due to low temperature time.

Feeding process-

Feed management one of the vital roles for successful culture. More times feeding (>5 times for summer crop) reduce the chances for hepatopancreas damage. We see that maximum 17-20% feed require for biomass purpose out of 100% feed input.

Problem for less feed management-

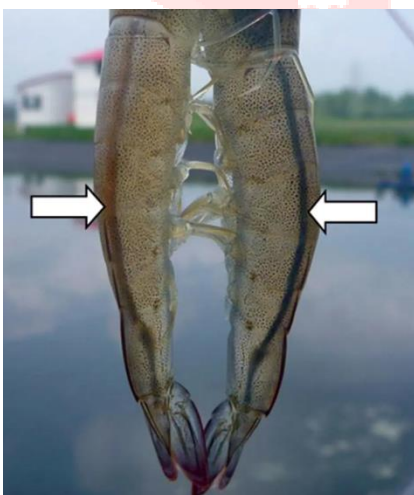
Slow growths due to fewer nutrients, higher FCR, Shell lose etc.

Problem for over feed management-

Increase organic waste, NH₃, NO₂, H₂S etc. Increase micro flora for vannamei.

Check Tray monitoring-

DOC	ABW (gm)	Check Tray Feeding (gm/kg Feed)	Check Tray Lifting (hrs)	Tray Time
21-30	1.5-3.5	2	2.5	
31-40	3.5-6.0	2-3	2.5	
41-57	6.0-11	3	2	
58-80	11-19	4-5	1.5	
81-Harvest	>19	5	1	



Best feed monitoring method require for intestine color check-

Monitoring After Feeding	Intestine Colour of Feed	Intestine colour of Natural Feed
1 hour	65%	35%
1.5 hour	50%	50%
2 hour	35%	65%
2.5 hour	25%	75%
10 min before next feed	Below 10%	Above 90%

Significant of Feeding Procedure

Intestine Colour Check	Remark
After 1hr later more than 40% natural feed	Under Feeding
Before 10 min of next feeding more than 10% Feed colour	Over Feeding

***Feed consumption depends on temperature.**

Proper feed consumption depends on-

Vannamei's feed consumption depends on water parameter, environmental condition, water quality, and molting cycle.

Best on proper feed management-

1st month feeding-100% of blind feeding as per happa survival

2nd month feeding-90% of TDF

3rd month feeding-80% of TDF

4th month feeding-75% of TDF

OR

After 60 DOC farmer can maintain 3-4 days one meal skip in every week at heavy temperature time due to vannamei can consume organic matter & reduce the COD demand.

Check Plankton population-

Use secchi Disc for periodically plankton population check & it is now good impact for better production.

Secchi Disc Range(cm)	Viability
Less than 20 cm	Dangerously DO problem in night
20-30 cm	Plankton will overabundant
30-45 cm	Ideal condition for species
45-60 cm	May be plankton scare
Above 60 cm	Clear water. Inadequate of plankton, dangerous to species.



Plankton create different water colour involve with production & disease-

- a) Golden Colour or reddish brown (25-30 cm)
- b) Light or bright Green (30-60 cm)
- c) Dark green or blackish green (5-15 cm)
- d) Dark Brown (<15 cm)
- e) Turbid (10-30cm)
- f) Foggy white (20-30 cm)
- g) Mycosyst (30cm)
- h) Black muddy colour (5-20 cm)
- i) White foam (10-15 cm)
- j) Clear water (<90cm)
- k) Yellowish colour (30-50 cm)

Check water parameter-

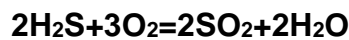
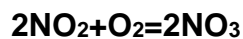
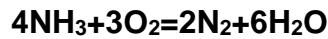
Parameter	Checking Time	Desire level
pH	Every Morning 6.30 am & afternoon 4.30 pm	7.8-8.2
Alkalinity	Weekly	Above 120 ppm
DO	Any time	Above 4 ppm
Temperature	Any time	28-32°C
Salinity	Weekly	10-15 ppm
Ammonia	Weekly	Below 0.1 ppm
Nitrite	Weekly	Below 0.25ppm
H₂S	Weekly	<0.02 ppm
Secchi Disc	11 am	30-40 cm
Ca	Weekly	160-200 ppm
Mg	Weekly	Above 250 ppm
K	Weekly	Above 40 ppm
Bacteria	10 days interval	GC<10 ² cfu & YC<10 ³ cfu

Use Compressor for better aeration system-

The compressor installation system can help increase the DO level at the pond bottom & stratification process not the obligation of DO level. Also, require paddle wheel aerator for proper feed zone clean at the pond bottom .Paddle wheel aerator also helps molting shell, wastage material, and uneaten feed accumulation at central drainage area.

We know that mainly protein source creates big harmful toxic gas in ponds. Approx. 59% protein stay in pond environment, approx. 22% protein intake by vannamei, approx. 19% protein accumulation in soil.

DO require for COD purpose- 70 to 80%



DO require for BOD Purpose-20 to 30%

Always maintain DO level >4ppm at pond bottom.

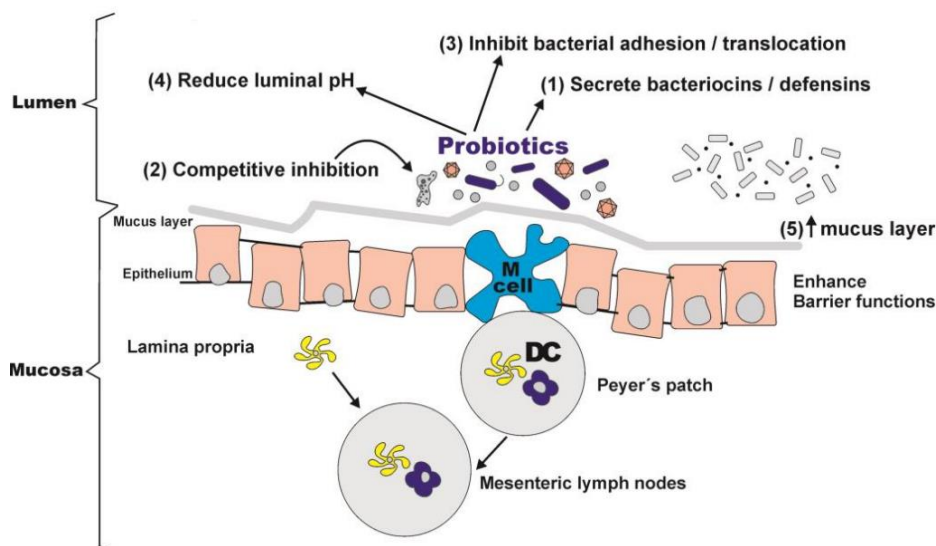
Conesus on carrying capacity of culture ponds-

Productivity depend on ponds carrying capacity

- Concrete & HDPE lined pond > Earthen lined mud pond
- For new ponds require aerator 500kg/HP
- For old ponds require aerator 200 kg/HP
- When carrying capacity reach in better position that's time partial harvest or full harvested the ponds.
- Organic waste > Carrying capacity**

Use Probiotic-

- Degradable the organic matter, eliminate ammonia, nitrite, hydrogen sulphate etc from pond water.
- Destroy the receptor cell
- Increase immunity power by decreasing inflammation & antibody response
- Produce organic acid to reduce intestine pH
- Sustainable the water pH
- Phyto plankton & zoo plankton stability
- Stimulate hormone, enzymes etc



Use proper minerals & lime-

- Maintain alkalinity
- Maintain for osmoregulation process
- Maintain pH
- Maintain physiology function
- Stimulate enzymes & growth promoting functions
- Maintain plankton populations
- Ratio maintains for minerals deficiencies.

Use Carbon Source

- Maintain C:N ratio
 - In normal condition C:N require 10:1
 - Ammonia Problem C:N require 16:1
 - Maintain pH level & plankton stability.
 - More carbon source reduces the nitrogen population. If nitrogen increases that's time grow cyanobacteria & also grow BGA activities.
- **Apply molasses and sugar for improving carbon sources.**

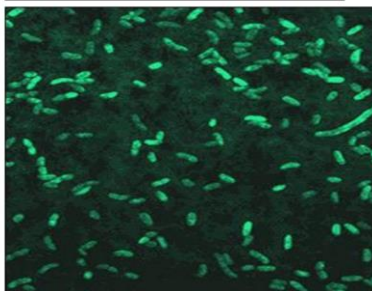
Use central drainage system-

Excessive organic matter influence the disease-

A lot of cockroaches in the kitchen if a lot of food remains



A lot of pathogenic bacteria in the pond if a lot of organic matters



We see that feed is wastage approx. 15-28% in every meal & also feces matter also accumulation at pond bottom.

Content of organic wastage matters accumulation at pond bottom

Protein-39%

Carbohydrate-44%

Fat-5.7%

Minerals-0.3%

Vitamin-0.3%

Fibre-3.3%

Others-7.4%

Central drainage system can reduce COD demand from water parameter.



Sludge accumulation in a single point



Bad smell of sludge

Sludge Pond-

Approx 8-10% area require out of total culture area.

Harvesting Technique-

If super intensive culture, always harvest by scoop net, otherwise chances for damage. Live harvest technique, good impact for materials quality.

ETP Management-

Post-Harvest situation water treatment is required for sustainability of ecosystem & reducing the water pollution. Water pollution help to secondary disease of vannamei culture. Various culture media use in ETP treatment ponds for reduces organic waste materials & TDS. Approx 10-20% area require out of the total culture area.

Handling & processing Technique-

Vannamei are washed and immediately killed in ice water 0-4°C. Also use sodium Metabi sulphate in chilled water for resist melanosis & red head. Vannamei are transporting in an insulated van to the processing plant or improving live harvest materials transporting to plant. Require of Iceing: Materials for 2:1 ratio & use layer 3:2 ratio basis for packing purpose. In plant quickly frozen -10°C & stored for shipment -20°C

❖ **Scope for increase domestic consumption**

Government can take necessary action for awareness of vannamei's utility. Big population of our country (approx. 140 cr) approx. 30% people may be consumed vannamei 1kg/year, it will be solved approx. 4.2 lac MT .Approx 50% pressure will down from exporting system.

Vannamei can help to our health development-

1)

- Delicious testy, no digestion problem
- Maximum (54.78%) PD yield get other than shrimp
- Vannamei gives us nutrition benefit-
 - Ca-6%
 - Sodium-550 mg
 - Protein-18 to 23 gm
 - Fat-1 gm
 - Fe-15%
 - Vitamin A-4%
 - Vitamin C-4%
 - Calories 80-120
 - Crabohydrate-1 gm
 - Also give Mg,K,Zn,Se,Cu,P etc
- Vannamei have major minerals of Ca, Mg, Na, K maintain human metabolism & control acid base equilibrium.Trace mineral of Zn,Se,Fe,Cu,P can help for bone structure, producing red blood cell, damage from cell & prevent of cancer, hormone & enzyme secretion,
- Anti-oxidant-free radicals help for not damage to skin
- Omega 3 Fatty Acid help for heart disease & reducing cholesterol level.

2) Vannamei use for domestic preparation-

- Crispy fried
- Recipe with pasta
- Malai curry
- Ghee roast recipe
- Butter garlic recipe
- Masala Curry
- More delicious testy curry made by vannamei

- ❖ Excessive vannamei consumption may be increase cholesterol & effect on skin disease.

❖ **Improve business policy**

1) Exporting system-

First farm registration at CAA & MPEDA. Maintain traceability all records. Then registration at BAP & ASC certificate. The PHT sample test require before harvesting time.

2) Feed Processing purpose-

Vannamei can use as ingredients for animal feed or fish feed processing purpose.

3) Vannamei powder processing –

Vannamei collect & dry in sunlight or others equipments. Then prepared the dust form by machine. Then use for curry in cooking time. The vannamei dust process system will be required by HACCP process.

Conclusion-Vannamei creates market demand in last 10 years. Higher yield potential, shorter cultivation cycle & vulnerability of less disease for producing vannamei. Good market demand from lesser size (>10gm).

Now vannamei industry standing on a very crucial moment. Maximum famers are huge losing their profit margin. All companies are depending on the farmers, but farmers not sustainability in their culture.

Now a day vannamei trade may be sustain depend some point of view. Require scientific guideline of farming. Good chances for employment solution. The export market is now more competitive due to saturate the selling position, every country produce huge quantity of the vannamei. **Domestic consumption may be helped all problematic export conditions, also enhance in big population. Others country have maintained good technology & scientific process produced for best production with less disease. Simultaneously our exporter has not created good market demand.**

Maintain for sustainability-

- 1) Crop plan
- 2) Proper sundry
- 3) Black soil remove
- 4) Central drainage
- 5) Biosecurity
- 6) PAC & PP dose in water entry time
- 7) Ready to use water facility
- 8) Nursery facility
- 9) Stock good quality seed
- 10) Improve aeration system
- 11) Maintain water depth & water exchange
- 12) As per require minerals & lime dose
- 13) Proper probiotic use
- 14) Proper feed monitoring as per check tray
- 15) Sludge remove
- 16) Proper way harvesting & transport to plant
- 17) All-time looks on production cost

Now mandatory for ASC & BAP certification due to properly maintain the traceability record for export process & domestic health benefit purpose.

Global scenario bad impacted the post covid situation. Require all time involve with vannamei slowly develop the problematic situation.

❖ **Species improvement-**

Comparatively species study of p.vannamei, p.indicus & p. monodon in this topic. Now it is time for selection that which species are given more production & more profit.

Appreciation-

Appreciate to MPEDA help for production data.

Appreciate to Dr.Isabel perez & Dr.Brian Kensely give good idea for advantage & disadvantage of p.vanname & p.monodon

Appreciate to google help for feed ingredients ,feed additive, benefit of additive & Different water colour.

Appreciate to Dr. Wee Kok Leong for help water exchange method.

Appreciate to Dr. Boyed for help for plankton population check.

Appreciate to Sukama Devi Fortuna gives some idea of health benefit.

Thank You

