Future of Vannamei

Bibhas Manna

Story of this topic-

Vannamei culture cum business industry standing in a critical position. Presently Eucador 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 tropic 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.


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-

![Graph showing price trend](https://via.placeholder.com/150)

**Vannamei, Tiger & scampi production in India**

![Graph showing production data](https://via.placeholder.com/150)

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

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stocking Density</td>
<td>Maximum density culture 60-400 pcs/m²</td>
<td>High S/D high risk</td>
</tr>
<tr>
<td>Temperature</td>
<td>Very high tolerant temperature 15°C to maximum</td>
<td>None</td>
</tr>
<tr>
<td>Salinity</td>
<td>Very high tolerant salinity 0-40 ppt culture</td>
<td>None</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>Per week growth 1.5 gm to 2 gm upto 20 gm ABW</td>
<td>Growth slow found after 20 gm</td>
</tr>
<tr>
<td>Disease Resistance</td>
<td>High susceptibility for various diseases due to very less resistant power.</td>
<td>They can carry any disease.</td>
</tr>
<tr>
<td>Dietary protein</td>
<td>Protein require 20-36%</td>
<td>None</td>
</tr>
<tr>
<td>Brooder</td>
<td>None</td>
<td>High quarantine parcel require</td>
</tr>
<tr>
<td>Feed Cost</td>
<td>Dietary proteins require very less (20-36%), so feed cost less than others.</td>
<td>None</td>
</tr>
<tr>
<td>Market</td>
<td>Well demand for USA, Asian Vannamei produced in</td>
<td></td>
</tr>
<tr>
<td>Demand</td>
<td>country &amp; European country due to high yield (66-68%)</td>
<td>world wide</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Harvesting size</td>
<td>Less ABW (&gt;10gm) can easily sale to local market</td>
<td>&gt;10 gm size not permits production cost.</td>
</tr>
</tbody>
</table>

Discuss on *penaeus indicus* (*Vande Bharat white leg species*)

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stocking Density</td>
<td>Maximum density culture 30-35 pcs/m²</td>
<td>Less production than vannamei in same area</td>
</tr>
<tr>
<td>Temperature</td>
<td>Desirable for temperature 26-30°C to maximum</td>
<td>High temperature impact for culture</td>
</tr>
<tr>
<td>Salinity</td>
<td>Very high 25-30ppt culture</td>
<td>Not good result in &lt;5ppt</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>Per week growth 1.0 gm to 1.5 gm upto 20 gm ABW</td>
<td>Growth rate slower 20-25 gm in 90-110 DOC</td>
</tr>
<tr>
<td>Disease Resistance</td>
<td>Less chances of WFS</td>
<td>They can carry any disease</td>
</tr>
<tr>
<td>Dietary protein</td>
<td>Protein require 25-35%</td>
<td>None</td>
</tr>
<tr>
<td>Brooder</td>
<td>Local capture, good advantage of procurement</td>
<td>Chances for contamination &amp; slow growth</td>
</tr>
<tr>
<td>Feed Cost</td>
<td>Dietary proteins require very less (25-35%), so feed cost less than others.</td>
<td>None</td>
</tr>
<tr>
<td>Market Demand</td>
<td>Well demand for local market &amp; export.</td>
<td>No headache for exporting system</td>
</tr>
<tr>
<td>Harvesting size</td>
<td>20 gm to 25 gm</td>
<td>&gt;10 gm size not permits production cost.</td>
</tr>
<tr>
<td>FCR</td>
<td>1.42 to 1.66 for 21-23 gm</td>
<td>FCR higher than vannamei</td>
</tr>
<tr>
<td>Production in per ha</td>
<td>Maximum production 5-6 ton/ha</td>
<td>Lesser than vannamei</td>
</tr>
</tbody>
</table>
**Discuss on penaeus monodon**

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stocking Density</td>
<td>Maximum density culture 25-40pcs/m²</td>
<td>None</td>
</tr>
<tr>
<td>Temperature</td>
<td>Above 15°C to maximum</td>
<td>&lt;10°C</td>
</tr>
<tr>
<td>Salinity</td>
<td>10-15ppt</td>
<td>&gt;26 ppt</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>Per week growth 1.5 gm to 2 gm unto 20 gm, then will slow growth.</td>
<td>&gt;30 gm</td>
</tr>
<tr>
<td>Disease Resistance</td>
<td>Resistance power more than other species.</td>
<td>None</td>
</tr>
<tr>
<td>Dietary protein</td>
<td>Protein require 36-42%</td>
<td>Chances for more toxic gas</td>
</tr>
<tr>
<td>Brooder</td>
<td>Local available</td>
<td>Chances for contamination &amp; slow growth</td>
</tr>
<tr>
<td>Feed Cost</td>
<td>None</td>
<td>Feed cost high</td>
</tr>
<tr>
<td>Market Demand</td>
<td>Well demand for Japan &amp; Asia country due to medium yield (62%)</td>
<td>Less demand</td>
</tr>
<tr>
<td>Harvesting size</td>
<td>Above 30 gm</td>
<td>Below 30gm, it now big panic</td>
</tr>
</tbody>
</table>

Require for proper feed ingredients

<table>
<thead>
<tr>
<th>Product Name</th>
<th>% of require</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish Meal</td>
<td>22-25% (source of protein)</td>
</tr>
<tr>
<td>Fish Oil</td>
<td>2-3% (Source of Essential Fatty Acid)</td>
</tr>
<tr>
<td>Premixes</td>
<td>0.1 to 1% for minerals &amp; 0.1 to 0.5% for vitamin</td>
</tr>
<tr>
<td>Wheat</td>
<td>20-22% (source of carbohydrate &amp; pellet purpose)</td>
</tr>
<tr>
<td>soyabean</td>
<td>40-44% (protein source)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Require nutrient</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bile Acid</td>
<td>Protecting liver &amp; promoting fat absorption</td>
</tr>
<tr>
<td>Probiotic</td>
<td>Lactobacillus, bacillus, Streptococcus etc</td>
</tr>
<tr>
<td>Immune product</td>
<td>Chromogenic acid, polysaccharides, Glucan, Mannan oligosaccharides, peptidoglycan</td>
</tr>
<tr>
<td>Organic Acid</td>
<td>Reduce gut pH &amp; improve digestibility</td>
</tr>
</tbody>
</table>
Advantage & dis advantage of additive product use in feed

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

Future of Vannamei’s sustainability depend on-

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

 viên (A): WSSV
 viên (B): WFD
 viên (C): EMS/AHPND
 viên (D): EHP
 viên (E): SPF

Consensus 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 vannamie culture. Vannamie 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 vannamie 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 vannamie 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-

<table>
<thead>
<tr>
<th>DOC</th>
<th>ABW (gm)</th>
<th>Check Feeding (gm/kg Feed)</th>
<th>Check Lifting Time (hrs)</th>
<th>Tray Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-30</td>
<td>1.5-3.5</td>
<td>2</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>3.5-6.0</td>
<td>2-3</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>41-57</td>
<td>6.0-11</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>58-80</td>
<td>11-19</td>
<td>4-5</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>81-Harvest</td>
<td>&gt;19</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Best feed monitoring method require for intestine color check-

<table>
<thead>
<tr>
<th>Monitoring After Feeding</th>
<th>Intestine Colour of Feed</th>
<th>Intestine colour of Natural Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 hour</td>
<td>65%</td>
<td>35%</td>
</tr>
<tr>
<td>1.5 hour</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>2 hour</td>
<td>35%</td>
<td>65%</td>
</tr>
<tr>
<td>2.5 hour</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>10 min before next feed</td>
<td>Below 10%</td>
<td>Above 90%</td>
</tr>
</tbody>
</table>

Significant of Feeding Procedure

<table>
<thead>
<tr>
<th>Intestine Colour Check</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 1hr later more than 40% natural feed</td>
<td>Under Feeding</td>
</tr>
<tr>
<td>Before 10 min of next feeding more than 10% Feed colour</td>
<td>Over Feeding</td>
</tr>
</tbody>
</table>

*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-

1\(^{st}\) month feeding-100% of blind feeding as per happa survival
2\(^{nd}\) month feeding-90% of TDF
3\(^{rd}\) month feeding-80% of TDF
4\(^{th}\) 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.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Checking Time</th>
<th>Desire level</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>Every Morning 6.30 am &amp; afternoon 4.30 pm</td>
<td>7.8-8.2</td>
</tr>
<tr>
<td>Alkalinity</td>
<td>Weekly</td>
<td>Above 120 ppm</td>
</tr>
<tr>
<td>DO</td>
<td>Any time</td>
<td>Above 4 ppm</td>
</tr>
<tr>
<td>Temperature</td>
<td>Any time</td>
<td>28-32°C</td>
</tr>
<tr>
<td>Salinity</td>
<td>Weekly</td>
<td>10-15 ppm</td>
</tr>
<tr>
<td>Ammonia</td>
<td>Weekly</td>
<td>Below 0.1 ppm</td>
</tr>
<tr>
<td>Nitrite</td>
<td>Weekly</td>
<td>Below 0.25 ppm</td>
</tr>
<tr>
<td>H₂S</td>
<td>Weekly</td>
<td>&lt;0.02 ppm</td>
</tr>
<tr>
<td>Secchi Disc</td>
<td>11 am</td>
<td>30-40 cm</td>
</tr>
<tr>
<td>Ca</td>
<td>Weekly</td>
<td>160-200 ppm</td>
</tr>
<tr>
<td>Mg</td>
<td>Weekly</td>
<td>Above 250 ppm</td>
</tr>
<tr>
<td>K</td>
<td>Weekly</td>
<td>Above 40 ppm</td>
</tr>
<tr>
<td>Bacteria</td>
<td>10 days interval</td>
<td>GC&lt;10² cfu &amp; YC&lt;10³ cfu</td>
</tr>
</tbody>
</table>
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%

\[
\begin{align*}
4\text{NH}_3 + 3\text{O}_2 & = 2\text{N}_2 + 6\text{H}_2\text{O} \\
2\text{NO}_2 + \text{O}_2 & = 2\text{NO}_3 \\
2\text{H}_2\text{S} + 3\text{O}_2 & = 2\text{SO}_2 + 2\text{H}_2\text{O}
\end{align*}
\]

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

a) Concrete & HDPE lined pond > Earthen lined mud pond
b) For new ponds require aerator 500 kg/HP
c) For old ponds require aerator 200 kg/HP
d) When carrying capacity reach in better position that’s time partial harvest or full harvested the ponds.
e) Organic waste > Carrying capacity

Use Probiotic-

a) Degradable the organic matter, eliminate ammonia, nitrite, hydrogen sulphate etc from pond water.
b) Destroy the receptor cell
c) Increase immunity power by decreasing inflammation & antibody response
d) Produce organic acid to reduce intestine pH
e) Sustainable the water pH
f) Phyto plankton & zoo plankton stability
g) Stimulate hormone, enzymes etc
Use proper minerals & lime-

a) Maintain alkalinity
b) Maintain for osmoregulation process
c) Maintain pH
d) Maintain physiology function
e) Stimulate enzymes & growth promoting functions
f) Maintain plankton populations
g) Ratio maintains for minerals deficiencies.

Use Carbon Source

a) Maintain C:N ratio
b) In normal condition C:N require 10:1
c) Ammonia Problem C:N require 16:1
d) Maintain pH level & plankton stability.
e) 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-**

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 parez & Dr.Brian Kensisely give good idea for advantage & disadvantage of p.vannamei & 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