The Shrimp Sector's Reckoning:

A Conversation with Eng. Hazem Shannak

Eng. Hazem has spent more than three decades inside the shrimp industry, not advising from a distance, but rebuilding farms that were failing, restructuring operations that had lost their margins, and designing production systems built to withstand disease, price pressure, and tougher buyer scrutiny. He works across Malaysia and the broader Asia-Pacific region, and he is one of the few people in this space who speaks equally well to a pond manager and a private equity investor. We asked him to give us his unfiltered view of where shrimp aquaculture in Malaysia stands now, and what it will take to move it forward.

Q1: Malaysia is one of Southeast Asia's established shrimp producers. What does the honest picture look like right now?

Malaysia has real strengths in shrimp production: established hatchery infrastructure, experienced farm operators, and coastal geography well suited to both Penaeus vannamei and Penaeus monodon culture. But the sector is not performing at the level its resources and experience should allow.

The core problem is that many farms are still running on production logic built for a different era. Monoculture, high stocking density, heavy reliance on feed and chemicals, and limited water-quality management beyond basic aeration are still common. Feed conversion ratios on many farms I have assessed are running between 1.8 and 2.2. For vannamei, that number should be closer to 1.1 to 1.4 under well-managed conditions. That gap represents wasted feed spend, poorer water quality, and higher disease susceptibility, and it compounds across every production cycle.

What concerns me most is the direction of travel. Input costs are rising. Buyers in premium markets are tightening requirements around traceability, residues, and environmental credentials. Disease pressure is not easing. Farms that have not built the operational systems to respond are being steadily squeezed out of the markets that offer better margins. The sector is at a fork in the road, and many operators have not yet chosen which direction they want to take.

Q2: Disease is the word that makes every shrimp farmer's jaw tighten. What is the disease landscape actually looking like across Malaysia and the region?

It is serious, and it is becoming more complex, not less. White Spot Syndrome Virus, or WSSV, remains one of the most damaging threats. It can move through a pond extremely quickly, especially where intake screening and biosecurity are weak. Once it is established, there is no treatment. Farmers are often left with two options: harvest early at a loss, or lose the crop. It remains one of the major causes of catastrophic production failure in shrimp systems across the region. Early Mortality Syndrome, formally known as Acute Hepatopancreatic Necrosis Disease, was devastating across Malaysia, Thailand, and China from around 2010 onward. It is associated with specific pathogenic Vibrio strains that damage the hepatopancreas of juvenile shrimp, usually early in the production cycle. In affected ponds, survival can collapse sharply. Today it is better understood than it was a decade ago, but it remains a real risk wherever water quality and biosecurity are weak.

Beyond those two, the disease picture includes Enterocytozoon hepatopenaei, or EHP, which does not usually cause mass mortality on its own but can reduce growth, create size variation, and weaken animals under stress. It is often under-diagnosed because the signs are subtle and easy to confuse with feed or stocking issues. Decapod Iridescent Virus 1, or DIV1, is another concern that has drawn growing attention in the region. Other pathogens, including Vibrio harveyi and Infectious Hypodermal and Hematopoietic Necrosis Virus, remain active in various production systems. What connects all of this is that disease incidence is not random. It is strongly shaped by environment. Shrimp kept in well-managed water, at appropriate density, under lower stress, and with better baseline health are far more resilient than shrimp living in unstable systems. The disease is the symptom. The environment is the diagnosis.

Q3: You are a strong advocate for probiotics in shrimp production. Where does that fit into the disease picture?

Probiotics are one of the most important tools available to shrimp farmers right now, not as a novelty, but as a practical response to two pressures that are both increasing: disease load and the declining usefulness of antibiotics as a management tool. For years, the default response to bacterial problems in shrimp ponds was antibiotic use. That approach became less effective as resistance increased, and it became commercially risky as export markets tightened residue controls. Major markets including the EU, Japan, South Korea, and the US maintain strict residue standards for imported shrimp. If a shipment fails, the immediate loss is not just the consignment; the commercial relationship is damaged, and the farm's reputation in that market can take years to rebuild. Probiotics, especially selected Bacillus species and other beneficial strains, work through competitive exclusion. They help shape a healthier pond microbiology, compete with pathogenic bacteria, and support the shrimp's innate immune function. In well-managed programs, the results are typically better survival, stronger feed efficiency, and more uniform growth.

The benefit is not only biological. A structured probiotic program can also improve pond conditions by accelerating the breakdown of organic matter in sediment and uneaten feed. That helps reduce hydrogen sulphide and ammonia, supports more stable dissolved oxygen, and lowers the bacterial load in the system. In practice, that creates a production environment where shrimp can perform more consistently. I have worked with farms that reduced their chemical input costs substantially after implementing structured probiotic management, while also improving harvest weight and survival. That is not a marketing claim, it is what happens when a farm shifts from reactive chemical dependence to a more disciplined biology-based system.

Q4: You talk about regenerative shrimp farming. What does that mean practically, not philosophically?

It means designing the farm so the ecosystem around it does more of the work, not less.

Conventional shrimp farming is extractive. Feed, chemicals, electricity for aeration, and other inputs go in. Biomass comes out. But waste, dissolved nutrients, sediment, and effluent are pushed into the surrounding environment. Over time, that degrades the water body around the farm, which then feeds back into poorer intake water, greater disease pressure, and higher management cost. It is a slow, self-undermining cycle.

Regenerative shrimp farming tries to close that loop. One example is mangrove-integrated shrimp culture, a system with deep roots in this region that was largely displaced during the push toward intensive production in the 1980s and 1990s. Mangroves can help filter effluent, stabilise water chemistry, provide habitat for beneficial species, and support carbon sequestration. A farm with a functional mangrove buffer often has a healthier environmental profile than one without it.

At the pond level, polyculture can also play a role. Sea cucumbers can help process organic material on the pond floor. Tilapia or milkfish can be used in connected settling systems to help filter water before it is discharged or recycled. Seaweed culture can help absorb dissolved nitrogen and phosphorus.

These systems do require redesign and, in some cases, capital investment. But the return is not only environmental. It is commercial. Farms that can produce shrimp from a genuinely regenerative system have a stronger story for buyers who are under pressure to prove where their protein comes from and how it was produced.

Q5: Let's talk about making shrimp farms investable and insurable, two things the sector does not discuss enough openly.

Not nearly enough. And the silence costs operators money they do not always see. An investable shrimp farm is one that a rational investor or lender can understand and back with confidence. That means documented production performance across multiple cycles, a management team that is not dependent on one person, an environmental footprint that does not create unnecessary regulatory exposure, and financial reporting that is transparent and scalable.

The most common failure I see is documentation. A farm may have completed many production cycles and have deep operational knowledge, but if none of that is recorded, the track record does not exist from an investor's point of view. No water-quality logs, no mortality records, no FCR data, no cycle reports means no evidence base. You cannot finance what you cannot evidence. The second failure is owner dependency. Too many farms still run because one person carries the critical knowledge in their head. If that person steps away, gets sick, or becomes unavailable, performance can fall quickly. Investors and lenders price that risk heavily, and in many cases they simply walk away.

Insurance works the same way from another angle. Underwriters will not insure a risk they cannot assess. A farm with no production records, no biosecurity protocol, no water-quality baseline, and no disease response plan is almost impossible to price accurately. The result is either rejection or premiums that make coverage commercially unattractive. The path to meaningful insurance coverage is the same path to investability: data, systems, documentation, and a management structure that does not collapse when one person is absent. Making your farm investable and making it professionally managed are, in practice, the same work.

Q6: For a shrimp farm operator who wants to expand - more ponds, more volume, new markets-what does that journey actually look like?

It starts with an honest diagnostic of where the farm really is. I have seen farms double their pond count and double their problems. If there is already a weakness in disease management, water quality, or biosecurity, expansion tends to magnify it faster and at greater financial cost. The farms that expand successfully tend to follow the same sequence: baseline assessment first, system strengthening second, documentation infrastructure third, and expansion only after that. It does not have to take years. A genuinely sound operation can move quickly. But shortcuts at the beginning almost always show up later as expensive problems. If the goal is higher margins rather than just more volume, the route is through certification and traceability. ASC, BAP, and GlobalG.A.P. are not optional extras for premium markets. They are entry requirements. The EU, the UK, Japanese retail chains, and premium food-service buyers increasingly treat certified, traceable product as the baseline. Uncertified shrimp tends to be sold as a commodity, and at commodity prices, Malaysia is competing with producers such as Thailand, Ecuador, and India on cost alone. That is a very hard race to win. Singapore's food-production ambition also creates a regional demand signal that Malaysian producers are well placed to serve. But serving that market requires consistency: volume, quality, certification, and supply-chain documentation. The opportunity is real. The question is whether farms are building toward it now, or waiting until the market arrives without the infrastructure to answer it.

Q7: Where does the shrimp sector go from here, and what will separate the operations that thrive from the ones that do not?

The sector is likely to split into two very different groups over the next few years:

On one side will be farms and businesses that have built documented, biology-driven, sustainable production systems. They will have reduced antibiotic dependence, invested in biosecurity and probiotic management, organised their production data, and built a credible story for buyers, lenders, and insurers. Those operations will have better pricing power, more access to capital, and more resilience when disease events occur.

On the other side will be operations still running the old playbook: high density, high chemical input, reactive disease management, weak documentation, and little product differentiation. Those farms are likely to face tighter margins, more difficulty accessing premium export markets, and greater exposure to shocks they cannot financially absorb.

The gap between the two groups is not technology. Most of the technology already exists and is accessible without enormous capital. The real gap is management discipline, knowledge transfer, and the willingness to build systems rather than depend on intuition and personal relationships.

That is where the real work sits. The future belongs to farms that can perform consistently, prove it, and adapt it into commercial value.

Q8: Everyone talks about seed quality going into the pond. How big a factor is it, and what should farmers actually be looking for from their hatchery?

It is a more significant factor than many farms acknowledge, and it usually only becomes obvious when the production cycle exposes the weakness.

The shrimp stocked on day one carries the biological potential and vulnerability profile for everything that follows. Specific pathogen-free, or SPF, broodstock have become the dominant starting point in vannamei production across Asia because they are certified free of major listed pathogens at the time of testing. But SPF does not mean disease-proof. It only means the stock was free of specified pathogens when it was checked. What happens in the hatchery after that, and in the nursery before the post-larvae reach the farm, matters a great deal. When I evaluate hatchery suppliers for clients, I look at three areas. First is hatchery biosecurity: how broodstock is sourced, how intake water is treated, and how larval health is monitored through each stage. Second is the feed and probiotic program during larval development. Post-larvae reared under consistent probiotic support often arrive with a more stable microbial baseline than animals raised in a more chemical-heavy, stress-intensive environment. Third are the physical indicators: size uniformity, active swimming, gut fullness, and response to stress testing. These are not complex diagnostics. They are basic checks that an experienced operator can make with simple tools. Too many farms still buy on price and availability alone. That is risky. Post-larvae are not a commodity input. They are the foundation of the production cycle. Buying them without proper evaluation is like building a house on soil nobody has tested.

Q9: Water quality is talked about constantly in shrimp farming. What does genuinely managing it involve, as opposed to just monitoring it?

Most farms monitor water quality. Far fewer actually manage it. That distinction matters. Monitoring means measuring parameters and recording them: dissolved oxygen, pH, salinity, alkalinity, temperature, ammonia, and nitrite. That is necessary, but it is only the starting point. Managing water quality means understanding why those numbers are moving, and intervening before they reach a level that stresses the shrimp. Dissolved oxygen is the most time-critical parameter. Vannamei begin to show stress below 4 mg/L and can begin dying below 2 mg/L. The hours before dawn are the most dangerous, because phytoplankton has been consuming oxygen overnight without photosynthetic replenishment. Farms with enough aeration and real-time dissolved oxygen monitoring at multiple pond depths can manage this window. Farms relying on one sensor in one location and a fixed aeration schedule are operating with too little visibility pH and alkalinity are often neglected, yet they are among the most important drivers of slow-burn performance problems. Shrimp generally do best around pH 7.5 to 8.5, and adequate alkalinity is needed to buffer daily fluctuations. If alkalinity is too low, pH becomes unstable, the animals are stressed chronically, and they become more vulnerable to opportunistic infection. In practical terms, water-quality management is really pond-ecosystem management. It involves the phytoplankton community, the bacterial community in the water and sediment, and the relationship between those communities and the shrimp. Probiotics, lime, aeration, feeding discipline, and regular pond-floor assessment all contribute. None of these are especially complicated. The difference is consistency.

Q10: Feed is the largest operating cost for most shrimp farms. What are the real levers for getting more from that spend?

Feed typically represents 60 to 70 percent of variable operating costs in shrimp production. How it is managed determines a huge part of the farm's margin.

The foundation is feeding discipline, not just feed quality. Many farms buy premium feed and then use it poorly: fixed quantities, fixed schedules, and little adjustment for pond conditions, weather, feeding response, or growth stage. Feed the shrimp do not eat does not disappear. It sinks, decays, increases oxygen demand, degrades water quality, and raises the pathogen load in the pond. In effect, the farm is paying to create its own problem. One of the most practical tools is the feeding tray, combined with structured feeding-response monitoring. Trays placed in multiple pond areas let managers see what shrimp are actually consuming between rounds. Feed can then be adjusted based on what remains, rather than on a rigid schedule. When that is combined with a good probiotic program, feed efficiency often improves and FCR can move into a more competitive range. Auto-feeders and sensor-based systems can help, but they are not the first step. The right sequence is to get feeding response under control, then add automation on top of a system that already works. If a farm installs automation on top of poor feeding discipline, it simply delivers the wrong amount of feed more efficiently. Feed management is a discipline. Farms that treat it that way, review FCR cycle by cycle, and adjust based on what the pond is telling them tend to outperform their peers, even when they buy from the same supplier.

Q11: What is the relationship between stocking density and profitability? Many operators seem to believe denser is always better.

That is one of the most expensive assumptions in shrimp farming. On the surface, the logic seems simple: more animals in the pond should mean more biomass at harvest and therefore more revenue. What it ignores is the management burden and disease cost that higher density creates. Shrimp physiology, stress response, and immune competence all change as density rises. Once density moves beyond what a farm's aeration, water-quality management, and biosecurity can support, the animals are under constant stress. That stress reduces resistance to disease, and outbreaks spread faster in crowded systems. The most profitable farms over multiple cycles are not always the densest farms. They are the farms with the best survival rates and the best FCR.

A pond stocked at 80 post-larvae per square metre with 85 percent survival and an FCR of 1.3 can outperform a pond stocked at 150 per square metre with 55 percent survival and an FCR of 2.1. Once the economics are modelled honestly, the picture becomes very clear. There is no universal stocking number that works for every farm. The right density depends on the farm's water-quality infrastructure, aeration capacity, biosecurity standard, and production system. The principle is simple: stock at the density your system can actually manage, not the density that sounds ambitious. High density without the system to support it is not high production. It is high-risk capital use.

Q12: Is small-scale shrimp farming still commercially viable in Malaysia, or is it being gradually squeezed out?

Small-scale is commercially viable. Badly managed small-scale is not. That distinction matters, and it gets lost too often in the debate about farm size. There is a tendency to assume that scale automatically wins. In some commodity sectors that is true. In shrimp, the picture is more nuanced because the product is highly perishable, quality-sensitive, and often sold into markets where consistency matters as much as volume. Smallholders can have structural advantages: lower overheads, closer relationships with local buyers, and the ability to manage ponds with daily attention that a salaried worker on a large farm may not always provide. The real vulnerability for smallholders is isolation. A farm of one or two hectares may have no access to technical advice, no collective bargaining power with feed suppliers or hatcheries, no structured disease surveillance, and no route into premium markets. The problem is not scale. The problem is lack of support and knowledge. The most promising answer is clustering. Small farms operating under a shared technical and commercial framework can reduce input costs through collective procurement, manage disease more effectively through shared biosecurity, and access better markets through group certification and common buyer relationships. The farmer keeps ownership and operational control. The cluster provides the infrastructure that individual scale cannot. Malaysia already has the geography, operator base, and proximity to premium regional markets to make that model work. The question is whether the sector will organise to build it.

Q13: How is climate change affecting shrimp farming in Malaysia specifically, and is the sector adapting fast enough?

Climate change is not a distant issue for Malaysian shrimp farmers. It is already changing the operating environment, and many farms are not adapting fast enough. The most obvious effect is temperature variability and more frequent extreme weather. Vannamei have a thermal comfort range, and once temperatures rise into the low 30s Celsius, stress increases sharply. That weakens immune competence and makes disease more likely. Longer hot periods are especially difficult for farms built around older climate assumptions. Rainfall variability is another major issue. Heavy rain can rapidly lower salinity in coastal ponds, and sudden salinity change is one of the most acute stressors shrimp can experience. It can trigger an osmotic crisis, suppress immunity, and in severe cases cause mass mortality within hours. Farms without real-time salinity monitoring and a plan for quick correction are exposed to serious losses from a single weather event. The adaptation tools already exist: pond shading, better salinity monitoring, species and strain selection based on tolerance, and biofloc or inland recirculating systems where the economics make sense. The gap is not knowledge. It is implementation. What is missing is the extension and advisory infrastructure to get practical solutions into the hands of farmers before the next weather shock makes the cost of delay obvious. The cost of being unprepared is much higher than the cost of adaptation.

Q14: What do export buyers actually want from shrimp suppliers right now, and how realistic is it for farms here to meet that standard?

Export buyers want three things, and they want them consistently: product safety, supply reliability, and a credible sustainability story. At the most basic level, product safety means no antibiotic residues and no banned chemicals. That is increasingly non-negotiable. Markets such as the EU, UK, US, and Japan all test imported shrimp consignments. If a shipment fails, the immediate loss is the container, but the bigger damage is the scrutiny that follows and the hit to the supplier's reputation. Beyond residues, buyers are asking for documentation: production records, water-quality logs, feed traceability, and hatchery sourcing information. These are no longer just certification-box items. They are becoming part of the commercial relationship itself.

Supply reliability is another pressure point. Buyers need consistency in volume, size profile, and harvest timing. A farm that loses a large share of production to disease, or cannot forecast its output reliably, becomes a difficult supply partner. That is why operational discipline matters so much.

The sustainability story is also moving quickly from differentiator to baseline expectation. Buyers in places like Singapore, the UK, and northern Europe are already pushing sustainability requirements down the chain. Farms with documented environmental management, water stewardship, and traceable practices have an advantage. Farms competing only on price are trying to win a game that is getting harder by the year.

Q15: Paint a picture for us. What does a shrimp farm actually look like when it has got all of this right?

I can describe it clearly, because I have helped build farms close to this standard, and the contrast with where many started is striking. It is a farm where harvest numbers are predictable before harvest day arrives. Pond managers check FCR data and feeding tray readings daily, and feed is adjusted in real time. Dissolved oxygen readings before dawn stay within target because the aeration system was designed for the biology of the pond, not copied from a neighbour. Water-quality parameters are logged and reviewed regularly. Probiotic dosing is consistent, not reactive. Disease management is structured and proactive. There is a written biosecurity protocol, and it is actually followed: controlled vehicle access, equipment disinfection between ponds, screened intake water, and no easy entry points for wild crustaceans. When a pond shows early signs of stress, the first response is environmental assessment, not chemical intervention. The hatchery source has been audited. Seed quality at stocking is documented. Previous cycle reports are used to improve the next cycle. The farm manager can explain what changed, why it changed, and what result it produced. Commercially, the farm has the documentation needed for premium market access. Financial records are clean. Production history is visible across multiple cycles. If a buyer, lender, or insurer asks for proof of performance, the evidence is there. That kind of farm is not fantasy. It is what disciplined management can produce. In the current Malaysian shrimp sector, it is still the exception rather than the rule. The gap between that farm and the average operation is not a technology gap.

It is a systems gap, and that gap can be closed with the right support, the right framework, and the willingness to do the unglamorous work of building a professional operation.

About Eng. Hazem

Eng. Hazem is a Consultant and an Aquaculture Business Growth Architect with more than 30 years of hands-on expertise in aquaculture and sustainable food systems, with deep specialisation in shrimp production across Asia. He has restructured under performing shrimp operations into high-yield, investment-ready enterprises and works with farm operators and agri-food businesses from production through to market access. He is the originator of the Blue Living Systems Framework and a specialist in Integrated Multi-Trophic Aquaculture (IMTA) and Regenerative Seawater Agriculture (RSA) across the Asia-Pacific region. His advisory work spans operational restructuring, investor readiness, biosecurity design, probiotic program development, and training for farm management teams.

To connect with Eng. Hazem or explore how his work might apply to your operation, reach out via his website hazemshannak.cc