

# A new benchmark in shrimp culture in Malaysia

iSHARP Setiu walks the talk with a unique modular design, fully lined ponds and canals, the highest level of biosecurity and controlled production with biofloc technology. By Zuridah Merican

Blue Archipelago Bhd started shrimp farming in 2008 at a 420 ha farm in Kerpan, Kedah, Malaysia. Taking on this existing farm, it embarked on an extensive renovation project to bring the farm up to current industry standards. It is now an integrated operation with a hatchery, farm and processing plant. Since then it has achieved recognition as a producer of premium shrimp with high quality standards. In 2009, Blue Archipelago started construction of a new farm on a greenfield site called iSHARP in Penarik Village, Setiu in the state of Terengganu. This farm brings modern shrimp farming to the next stage, addressing the most pressing challenges of the day, with the highest level of biosecurity, vis-à-vis location and design of the farm. iSHARP stands for integrated Shrimp Aquaculture Park.

"Together, we have incorporated our past knowledge in shrimp farming and the challenges we have faced and expect to face, and have built what we see as a shrimp farm for the future. Our tagline 'quality, safety and ecology' underlines the prerequisites in shrimp production to be sustainable. Our team is committed to ethics and transparency in production and this is clearly shown in Kerpan and now in Setiu," said Christopher Lim, COO. Lim is a veteran with almost 30 years in shrimp farming, most of them in one of Indonesia's largest farms in Lampung.

## A unique design

The farm in Setiu will comprise two phases, with a total of 616 ponds. Phase 1 has 216 ponds and is nearing completion. Water for the whole complex is drawn some 1.8 km in the South China Sea to a large volume pump station. In this way, good water quality of high salinity is assured. A modular design for the ponds may seem normal in shrimp farming, but two features stand out. In the design, each module has its own delivery canal for water from its four treatment ponds. From the main supply canal which stretches for 2.5 km, water is filtered through a series of 1000 micron and 250 micron filters on entering the first treatment pond. Two modules share a discharge canal. Each module acts as a commercial unit and the design allows the module to be completely 'locked down' in case of disease.



Bujang Slamet (left) with Agus Mashadi

Each module of 24 ponds, comprises 20 production and 4 treatment ponds, all 0.5 ha in size. The delivery canal is elevated. All discharge water is emptied into effluent treatment ponds. According to the regulations by the Department of Environment Malaysia, the quality should meet its effluent standards on BOD/COD, pH, etc. before discharge into the river. All the ponds and water distribution channels are fully lined with 0.65 mm HDPE liners. For biosecurity reasons, the intake system operates on a double pumping system to prevent leakages due to gravity.

## Production standards

Trial production started in October 2011 with 4 modules. Now, in its first cycle, growth performance of vannamei shrimp has been good at



Pond with brown water at 84 DOC with shrimp of 16 g. The target is 90 days for harvesting. Autofeeders are used for all the ponds. These dispense 30kg of feeds 30 times/hour.



Feed tray



an average of 16 g at 100 days of culture (DOC). The yield averages 8 tonnes/pond (0.5 ha), stocking density is 100 PL/m<sup>2</sup> and survival rate is 95%. Feed cost in this cycle was lowered with biofloc technology. The average feed conversion ratio (FCR) was 1.4 and the best FCR was 1.2. In comparison it would be 1.6 using conventional culture technology. The average daily growth should be 0.17 g-0.18 g and at 40 DOC, shrimp should be 7 g. This will act as the standard for the farm which is capable of 2.4 crops/year.

Currently, the team at the farm comprises the farm manager, Haji Umar and two experienced production managers, Bujang Slamet and Agus Mashadi. Together, Bujang and Agus have more than 30 years of experience in intensive shrimp culture. Indonesian born Bujang and Agus worked at the then Dipasena farms in Lampung Indonesia. Bujang, who conducted the test trials at this farm is responsible for 4 modules whilst Agus will soon start production in the 5th module. Previously, Bujang was attached to the farm in Kerpan for nearly a year. They are assisted by skilled and unskilled workers from the surrounding local villages.

Blue Archipelago has a social responsibility to provide employment to the community. According to Bujang, one asset is the new 150 member staff which the team can easily train and build up camaraderie.

"When part of the ponds was completed, we started cautiously. We began with stocking at various stocking density: 40 PL/m<sup>2</sup>, 60 PL/m<sup>2</sup>, 80 PL/m<sup>2</sup>, and then up to 130 PL/m<sup>2</sup>. We took the precaution as we wanted to see how our ponds and design fare during the monsoon," said Bujang.

"When we started with stocking only 40-60 PL/m<sup>2</sup>, growth averaged 21 g in 100 DOC. Now we are confident that the 100PL/m<sup>2</sup> stocking



Harvesting

density will be our standard. One advantage of these lined ponds is the cleaning process. You will see that within 2 days we can finish preparing a pond. In comparison it would have taken us 2 weeks for a soil bottom pond. This not only gives us a fast turnover but is less labour intensive for the workers."



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Bujang holds just harvested 16 g shrimp



Overview of ponds and supply canal in phase 1

### Sustainability with BFT

These lined ponds are ideal for the application of biofloc technology (BFT) which Bujang and the team are well versed in. However, he emphasised that in most ponds they are not practising the full BFT concept i.e. high stocking density and dependence on the inherent microbial population in the ponds for growth. BFT is ideal for zero exchange of water with the only water addition to compensate for evaporation. It results in less impact on the surrounding water environment and better control of disease. The main requirement for BFT is to have an adequate aeration system. The farm has a standard of 14 hp per 0.5 ha. There are 10 paddlewheels of 6 two hp units and 4 one hp units in each ponds. The pond water will start to become brown with heterotrophic bacteria by 30 DOC. Removal of sludge and siphoning are required for pond bottom management and to prevent excessively high levels of nitrite. The design of the ponds has already included this feature.

"I estimate the feeding requirements based on a survival rate of 90%. I do not use the feeding tables provided by the feed companies. In general our feed amount is about 20% less than recommended. Daily, we will tabulate the FCR and if there are any leftover feed we do not add to the feed amount but if feed is not finished, we will reduce the amount by 10-20%. The pH should be a minimum of 7.5 to a maximum of 8.0. We use molasses and grains to balance the C:N ratio in the ponds," said Bujang.

### Biosecurity

The likelihood of a disease incidence has not been left to chance. At iSHARP, all production ponds have overhead bird scare nettings. Only those responsible for a module are allowed into the area. During harvesting, carried out by farm employees, only the farm lorry is allowed on the dyke. Throughout the harvest process which usually starts before dawn and lasts 4 hours, the lorry will be transporting the harvest to the harvest station. Here the shrimp is packed in ice before being sent on to the final destination, either the local market or the processing plant.

As many farms in Malaysia continue to face early mortality syndrome (EMS), Bujang has to be on alert to any potential incidence here in Setiu. The farm is quite secluded with only one other farm close by. Aside from routine monitoring of stock in ponds and of water conditions, he is also using his experience in Kerpan where from day 1 to 30 DOC, the pond water must be green to prevent EMS. He has to keep this in mind, even here in Setiu.

"With the operation of phase 1, a thorough review will be conducted and we will continue to innovate to bring the latest technology and system into phase 2. Currently, we hope iSHARP's biosecurity and environmental sustainability plus BFT will move the industry forward to a different level of shrimp farming," said Lim.



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