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How to farm freshwater shrimp.

Shrimp farming is a very easy and profitable business. It is actually an aquaculture business that exists in either a marine or freshwater environment. Producing prawns or shrimp for human consumption is the main aim of this business. Marine shrimp farming is especially popular in may Asian countries and is a very old business. Shrimp was generally considered as a secondary crop in traditional fish farming systems, until a decade ago. The shrimp fry trapped in salt beds, coastal paddy fields or brackish water fishponds are allowed to grow to marketable size and harvested as secondary crop. But in recent years, producers have started to produce shrimp commercially as principal crop. And many farmers have converted their rice fields, fish ponds and salt beds into shrimp farms. Traditionally, the fish ponds are stock with fry either collected from the wild or concentrated through tidal water entering the ponds. But today, most of the shrimp producers are using modern systems for producing shrimp. And high production is possible in a small piece of land. Freshwater shrimp farming is also becoming popular gradually. The global annual production of freshwater prawns in the year of 2010 was about 670k tons. And China is the largest producer.[1] Advantages of Shrimp Farming Business Shrimp farming business has many benefits or advantages. That's why it's gaining popularity gradually. Here we are trying to describe the top advantages of this business. Commercial shrimp farming is a very old business. And many people are already doing this business for making profits.Starting this business is very easy. Even the beginners can start it with basic training.If you already have a pond, then you can use that existing pond for growing some shrimp.Most of the shrimp species generally grow fast. So, you will be able to make good profits from a very short period of time.You can stock shrimp with other fish species. But you should culture only shrimp for having good production.You can start both saltwater and freshwater shrimp production business depending on the available water type in your area.If you want to raise some poultry birds in your farm, then you can build the house above shrimp pond.Commercial shrimp farming is a good and profitable business. So, it can be a great source of employment for the rural people.Commercial production can also be a good employment source for the educated unemployed young people.Pond or tank construction costs are high. But the returns are also good. Shrimp grow faster, so you will get your invested money back soon.Today, there are many hatcheries available in most of the areas where shrimp production is popular. So, you will probably be able to easily purchase the fry.Demand and price of shrimp in both local and international market is very high.Shrimp is popular throughout the world. So, you don't have to worry about marketing your products. You will probably be able to sell your products in the local market.Shrimp is very tasty and nutritious. And you can enjoy fresh shrimp if you start producing in your own farm. How to Start Shrimp Farming Business As we have mentioned above, shrimp farming is very easy and simple. Even the beginners can start this business. But you must have to complete a training if you want to produce shrimp in tanks using modern technologies. So, try to have practical knowledge before starting large scale commercial production. Here we are trying to describe more about the steps for starting and operating a successful shrimp farm. Land Selection First of all, you have to select a very good location for starting this business. It will be better if the selected location is calm and free from noise and pollution. Avoiding residential areas will be good. Ensure electricity, water and good transportation systems are available in your selected area. If your existing land has all these facilities, then you can start commercial production in your land. Type of Your Farm You can start growing shrimp in many different ways. You can use earthen ponds, concrete tanks, plastic tanks or any other type of water reservoir for growing shrimp. Pond Design & Construction Consult with an existing shrimp farmer in your area for having good recommendations about pond design and construction. Generally simple pond with adequate water depth is ideal for shrimp farming. You can also contact with your nearest fisheries institute to learn more about specific pond design. Good pond management helps to keep the fish in good health condition, and also ensures better growth. Tank Setup If you are willing to grow shrimp in tanks, then you have to build the tanks perfectly. You can make concrete or plastic tank or any other type. Please consult with an expert for more details. Soil Quality The types and texture of the soil of your selected area should be analyzed before setting the land for shrimp production. Take soil samples from random location (preferably up to a depth of 0.5 meter). And perform both physical and chemical tests to determine the acidity, amount of organic load, level of fertility and physical composition. Presence of enough clay content in the soil is important for shrimp production. Sandy clay or sandy loam soil is considered good for commercial production. Water Quality Maintaining good water quality is also important for shrimp farming business. Water quality includes all the inherent physico-chemical and microbiological characteristics of water. Right pH level is a very important factor for shrimp production business. The pH range of the water should be between 7.5 and 8.5. Also determine fluctuations in dissolved oxygen level in the water. And this level should not lower than 4 ppm. Shrimp Species Selecting the right shrimp species is very important. You can choose Giant River Prawn if you live in the areas with freshwater. And you can choose Giant Tiger Prawn if you have access to saltwater. Choose the breed depending on the availability in your area. Feeding This is the most important part of modern commercial shrimp farming business. Because good and nutritious food ensure better growth and maximum production. Traditional shrimp producers depend on the natural source for feeding the shrimp. But you must have to provide them with adequate supplementary feeds if you want to have good yield. Today, there are many companies available which are producing commercial feeds for feeding the shrimp. Such food is produced specifically for feeding shrimp. You can use these ready-made commercial foods for getting better production. Breeding You should purchase the fry from hatcheries instead of breeding in your own farm. Breeding shrimp is very difficult and require a lots of money and technical knowledge. Caring & Other Management Taking good care of the shrimp is very important for commercial production. Good caring helps the shrimp to stay healthy and grow better. So, try to take good care of them. Monitor the health of the shrimp on a regular basis. And ask for help from an expert if you face any problem. Harvesting Most of the shrimp species are fast growers. They will reach marketing weight very fast. You can harvest all the shrimp at once or collect the big one first and smaller one later. There are many local methods used for harvesting shrimp. Marketing Marketing shrimp is very easy. It is one of the top advantages of shrimp farming business. You will probably be able to easily sell your products in the local market. These are the common steps and ways for starting and operating a successful shrimp farming business. It's very easy and simple. Hope this guide has helped you! Good luck & may God bless you! Shrimp farming requires hundreds of activities on a daily basis. As Alune learns from, works with and designs standard operating procedures (SOPs) and data solutions for farms around Indonesia, we have been keeping a list of our top tips. Some you will know, but some we hope will be new and useful for your farm.1. Sterilise everything Sterilisation is an important step to provide a disease-free environment for the shrimp. Before stocking begins, it is important to sterilise all aspects of the farm – the pond itself, all the equipment and the culture water – to make sure that pathogens are eradicated and the risk of disease minimised. Here's how to start: Pond and equipment sterilisation First, clean the pond and equipment with high pressure spray containing disinfectants. It is recommended to use 10 ppm of trichloroisocyanuric acid (TCCA) and 30 ppm of sodium hypochlorite. See below for the recommended exposure time and concentrations for chlorine disinfection. Figure 1. Recommended exposure time and concentrations for chlorine disinfection © (Samocha, 2019) After disinfection, scrub the pond lining to make sure that the biofilm is lifted. Then, remove all the leftover sludge from the previous cycle as this is a source of pathogens and harmful components. If the farm suffered from disease outbreak in the previous cycle, use lime with a pH up to 11 to eradicate spores and prevent further outbreaks in the next cycle. Water sterilisation Water sterilisation requires two steps: prefiltration and disinfection. For prefiltration, use filters with a mesh of less than 200-300 microns at the water inlet to prevent entry of pathogens, predators and undesirable settleable solids. The filters should be maintained regularly by rinsing them with clean water and removing any deposits. As for water disinfection, use chemical disinfectants to eradicate all the pathogens. Apply 20-30 ppm of sodium hypochlorite 60 percent, 0.5-2.5 ppm of KMnO4 and 10 ppm of TCCA to the filtered water for 24 hours. Maintain full aeration during chemical disinfection. To remove the leftover chlorine, use the right amount of sodium thiosulphate by multiplying the leftover chlorine concentration by three. Finally, apply it two to seven times over 24 hours. Biosecurity is one of the key ways to prevent disease infection in a farm and also further outbreaks in the region; it benefits not only one farmer but also the whole neighbourhood. In shrimp farming, biosecurity is often disregarded as a mere addition of unnecessary infrastructure and complex procedures with unclear monetary benefit. However, the importance of biosecurity cannot be overstated since it is one of the key ways to prevent disease in a farm and also further outbreaks in the region; it benefits not only one farmer but also the whole neighbourhood. Biosecurity works by preventing pathogen entry and excluding pathogens from the farm. Here are some of the simplest biosecurity measures you can start to implement at your farm. Use a pond liner – the most commonly used material is high-density polyethylene (HDPE). Using a pond liner allows easier water control since the water does not interact directly with soil, an interaction that could trigger a complex anoxic reaction, which is highly toxic for the shrimp.Protect the farm with fences – to prevent wild animals, such as crabs, which may carry undesirable pathogens, from entering.Control the movement of people and vehicles – it is important to make sure that all employees and visitors go through disinfection and cleaning procedures before and after entering and working. All vehicles should go through the same procedures before entry and exit.Place feed and probiotics in a specific storage room – to maintain cleanliness, prevent contact with outside vectors which may carry disease, and to provide a more stable temperature for better feed maintenance.Make sure there are labs available in the area – labs are important for two essential things: assessing water quality and checking for diseases. Having a reliable lab in your area is highly beneficial, as doing these checks locally is much quicker than, for example, sending your water or shrimp sample to another city. Simple biosecurity measures like nets and pond liners can go a long way towards preventing disease outbreaks Alkalinity is one of the most critical water quality parameters since it directly affects pH fluctuation and bacterial composition. It is recommended to maintain alkalinity at 120-150 ppm. Maintenance of alkalinity can be done by applying bicarbonate or carbonate compounds, such as NaHCO3, KHCO3, Na2CO3, CaCO3, and CaMg(CO3)2. It is better to apply treatment periodically rather than when alkalinity spikes occur. To maximise alkalinity increase, the amount applied at each treatment time should not be more than 20 ppm. To know the right amount of bicarbonate compounds to be applied, you need to know the current alkalinity concentration, which is why periodic measurement is important. This simple formula might help: (target alkalinity - current alkalinity concentrations)*2 Alkalinity treatment is recommended to be done at night or early morning. Bicarbonate compounds will react with carbon dioxide (CO2) which are more available at night due to respiration of all organisms. 4. Calibrate all your measurement tools It might seem simple but before every cycle make sure that all your measurement tools are calibrated. This includes your dissolved oxygen (DO) meter, pH meter, refractometer and chemical test kit. Uncalibrated tools might cause a significant error which may lead to grave mismanagement due to inaccurate data. Calibrated tools may help you gain more accurate data on the conditions of the farm and allow them to make more educated decisions. 5. Assess post-larvae (PL) and shrimp health Before stocking, PL from hatcheries should be checked regularly – by sight or, even better, by microscope. Shrimp health should also be assessed once a week after stocking. This is beneficial for maintaining optimal shrimp growth and detecting possible signs of disease. The key things to check are if: The shrimp are swimming activelyTheir morphology is normalTheir guts are fullThey have no adhering organismsThere is no cloudiness in the muscleThe muscle to gut width ratio is 3:1The hepatopancreases are large and darkThe gill is white or greyishThere is no melanisation (shown by black to brownish spots)There is no moulting residue on the shrimp headsThere are no cuts or twists on their bodies 6. Take shrimp samples regularly Sampling allows farmers to understand shrimp growth and adjust the feed regime, preventing overfeeding and underfeeding. It is recommended to take shrimp samples every five to seven days using nets appropriate to the current shrimp size. Sampling is done to estimate the mean body weight (MBW), which is calculated by dividing the total weight by the number of shrimp. Farmers should take regular samples of shrimp to ensure they are using feed efficiently What is also important to note is how to take the samples, which should be done representatively. Avoid sampling near the feed trays because the shrimp there tend to be bigger than the rest. Take random samples vertically – covering the top, middle and bottom of the water column – as well as horizontally, covering various sides of the pond. Avoid sampling when the shrimp are moulting. 7. Use the baby bucket method for sampling The total number of PL obtained from the hatchery is usually ascertained by counting a sample of the PL bags. After stocking, farmers usually do not take follow-up samples, but it is very important to know the survival rate 24 hours post-stocking. It may give us a clearer picture of the shrimp population after they have undergone a stress-inducing process and acclimatisation. We are experimenting with the baby bucket method for estimating the survival rate. The baby bucket is a little bucket with holes on the side covered with mesh. To take a sample, fill the baby bucket with 100 PL and leave it on the surface of the pond for 24 hours. After 24 hours, the PL can be counted to estimate the initial data on population and survival rate. The data is crucial because it can be used to adjust the right feeding regime to avoid overfeeding or underfeeding. 8. Be aware of moulting Moulting allows shrimp to grow bigger and is a moment in the shrimp grow-out period that needs particular attention. We need to know the moulting phase the shrimp is in by taking regular samples, this way we can better prepare when moulting happens. It is better to prepare the right environment by providing enough micro and macro nutrients to help the shrimp undergo the formation of the new exoskeleton. This may help prevent moulting problems and mortalities due to failed moults. Some of the beneficial minerals to help shrimp during moulting are: Ca, Cu, Mg, Na, P, K, Se, and Zn. 9. Apply probiotics at the right time Probiotics are good bacteria which may boost shrimp growth, prevent stress and disease, as well as maintain good water quality. Probiotics are better applied at the beginning of the cycle, helping the juvenile shrimp acclimate to the new environment and enhance water quality. It is also recommended to apply probiotics during stressful situations for shrimp, such as water exchange and partial harvest. The good bacteria work by enhancing the shrimp gut health and maintaining a relatively good environment, both of which decrease the stress level. Applying probiotics during a partial harvest can reduce their stress levels and improve their finishing quality © Anne Thaisin Shrimp farmers usually stock PL from hatcheries directly to the grow-out ponds but this is risky because PLs have a relatively underdeveloped immune system. While it requires investment in infrastructure, a nursery phase helps reduce that risk by making sure that the immune systems of the PLs are enhanced before the grow-out period. To achieve this, PL from hatcheries should be stocked in relatively small nursery ponds or tanks, with a density of more than 2000 PL/m2, for 30 days. The small size of the ponds/tanks, means that fewer probiotics are needed and these will be more effective compared to in bigger grow-out ponds, thus reducing mortalities and costs. Conclusion - implementing the basics We understand that each farm has specific needs and challenges. However, breaking it down to the basics, these tips are applicable to various farmers across different circumstances. We hope that these 10 simple tips can help shrimp farmers implement better management regimes for their farms. There are a lot of other tips that are specific for each part of the culture period that we will cover, so stay tuned for our next instalment in this series. The Alune farming experts will be sharing their experiences and research in regular articles on The Fish Site as part of the Closer to shrimp aquaculture series. *Alune is part of Hatch's portfolio, but The Fish Site remains editorially independent. Alune is the leading aquaculture financial technology company, working with farmers, investors and technology partners. Alune uses their in-house farming expertise, end-to-end risk management and partnerships to support farmers and partners achieve their goals.

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