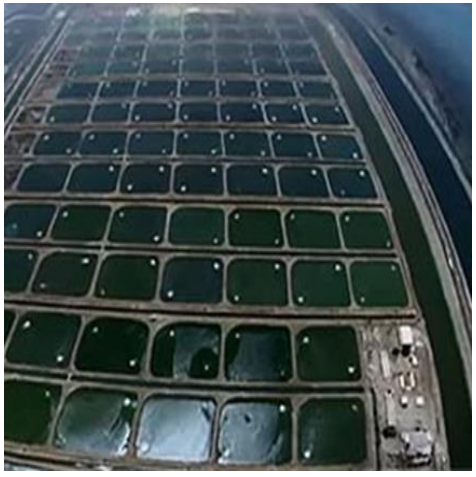
Abstract for Shrimp Farming

This abstract reflects general technical and market aspects of shrimp farming



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INTRODUCTION OF SHRIMP FARMING

Aquaculture, the farming of aquatic organisms, is the fastest growing type of food production in the world (Tidwell, 2001). Nearly 50 % of the fish consumed by humans is farmed (Kourous, 2006). Globally the wild fish stocks are declining whilst the demand for fish is constantly increasing, making the prospect of aquaculture increasingly attractive (Peters, 2007). Additionally, the necessity of aquacultures is getting more important due to the fact that already in 2010 two thirds of all stocks of known status under Regional Fisheries Management Organizations (RFMOs) were depleted or being overfished. For example, stocks of tunas and their relatives have declined on average by 60% during the last half century and the majority of these stocks are either fully or overexploited (Sumaila, 2015).

Crustaceans have the highest value, this is due to their high average price of shrimps, prawns, crabs and lobsters. Hence the aquaculture of these represents a high value product with a high global market demand. Shrimp farming is a well established aquaculture production. The available state of the art technology for shrimp farming will produce sustainable, healthy live product. Such a modern farm will be less susceptible for production loss due to diseases, stress and other environmental factors as every parameter in this farm is optimized and controlled.

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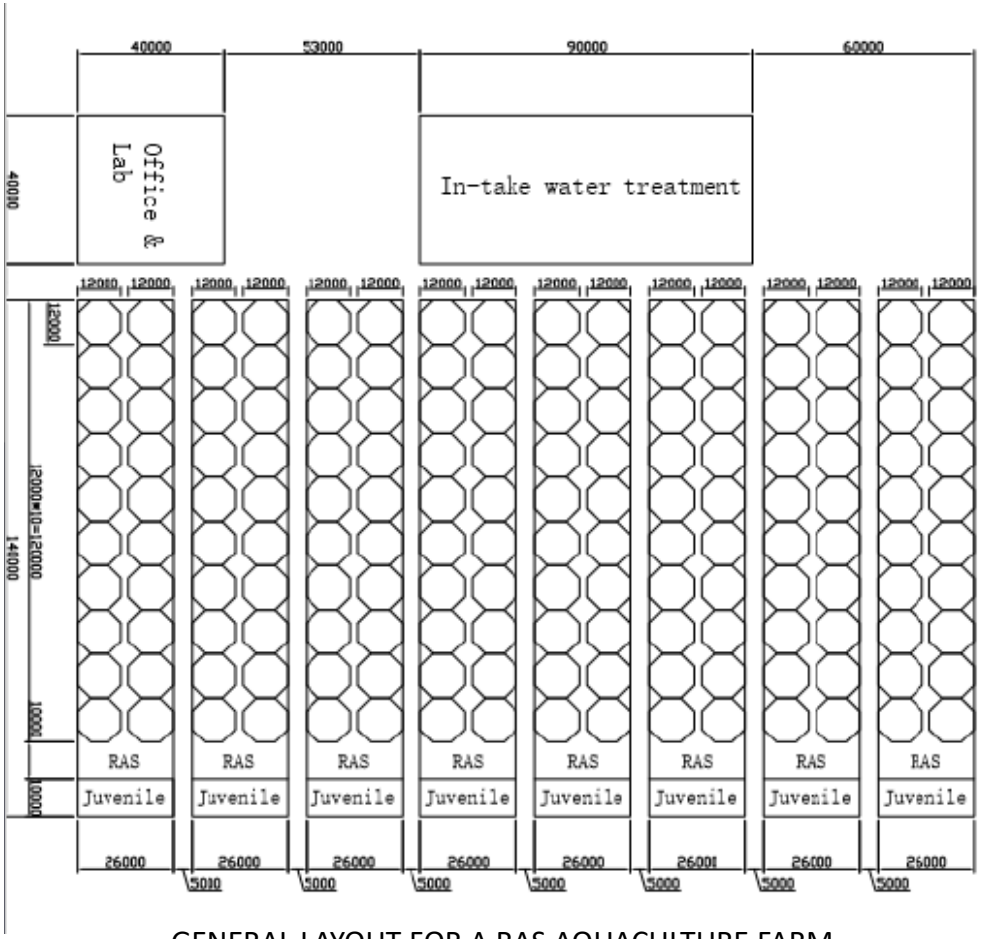
THE FARMED PRODUCT

Shrimps play important roles in the food chain and are an important food source for larger animals ranging from fish to whales. The muscular tails of many shrimp are edible to humans, and they are widely caught and farmed for human consumption. The only product farmed on this farm will be live shrimp for market. *Litopenaeus vannamei*, known as the white leg or vannamei shrimp, is one of the suitable species for farming. They have a sweet taste and a firm structure, and are a rich source of protein. They are grayish white and turn pink when cooked. The taste of this product is pure, thanks to its reduced salt content. The shrimp will be sold fresh and whole, but could also be sold frozen.

FROM HATCHERY TO FINISH PRODUCT

The shrimp will be bought as so called juveniles and will be raised to fully grown shrimps that can be sold, subsequently.
The shrimp farm project will start with shrimp juveniles in the beginning (Phase I). Subsequently, they will be relocated in the grow-out ponds (Phase II). For this two phases, two different RAS (Recirculating Aquaculture System) will be used. RAS are used in home aquaria and for shrimp production where water exchange is limited and the use of biofiltration is required to reduce ammonia toxicity.



GENERAL LAYOUT FOR A RAS AQUACULTURE FARM

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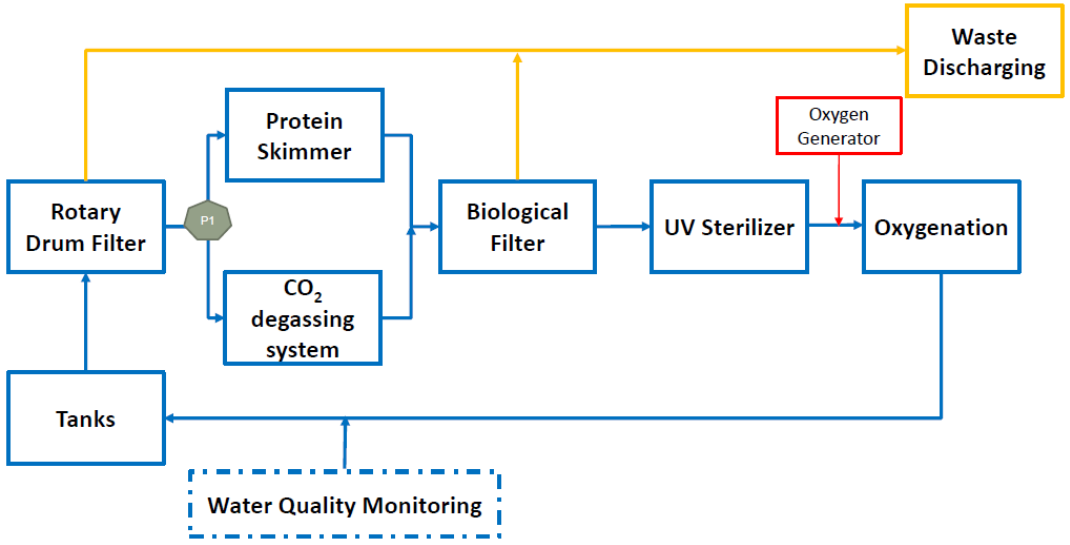
FROM HATCHERY TO FINISH PRODUCT

Other types of filtration and environmental control are often also necessary to maintain clean water and provide a suitable habitat for shrimps. The main benefit of RAS is the ability to reduce the need for fresh, clean water while still maintaining a healthy environment for shrimps.

The shrimp will be fed by a mixture of natural and supplied food and will continue to grow for a period of six months.



GENERAL RAS LAYOUT FOR GROW OUT PONDS

After this the shrimp will be harvested and placed into specialized containers for shipment to market. The ponds will be emptied, cleaned and the process starts over.

Constant environmental monitoring takes place using water quality testing samples. Untreated discharge from shrimp farms can cause permanent ecological damage especially to coastal areas and mangrove swamps. The proper treatment of dissolved sediments is essential for a healthy farm as well as a healthy environment.

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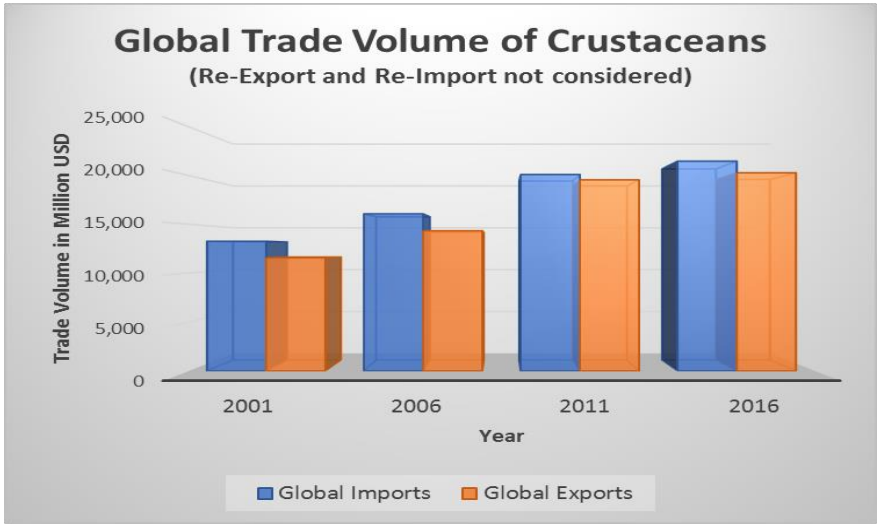
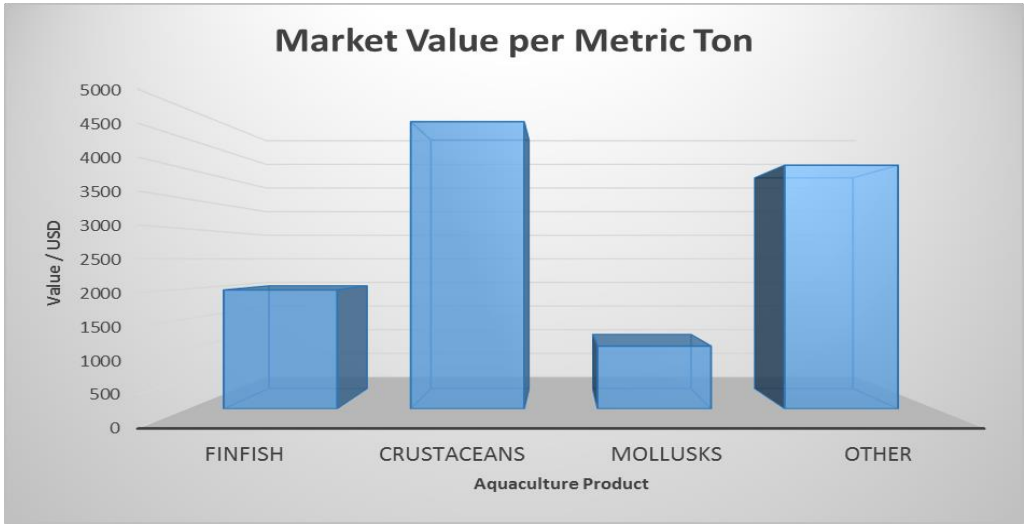
MARKET

Due to globalization, urbanization and a higher level of information the 21th century consumer tends to substitute low value foods, like rice, corn or wheat, with high value foods, for example: diaries, fruits and vegetables as well as meat and sea food. With the growing per capita income and the life style`s convergence all over the world staples get more and more exchanged by more expensive foods.

Global fish production has grown steadily in the last five decades, with food fish supply increasing at an average annual rate of 3.2%, outpacing world population growth at 1.6 %. There is an increasing demand for high quality seafood products and an increasing awareness of consumers for the nutritional value of seafood products (Feidi, 2009).





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MARKET

As shown in the figure before, crustaceans like shrimp represents a high value seafood product. Commercial shrimp species support an industry worth 50 billion dollars a year, and in 2010 the total commercial production of shrimp was nearly 7 million tones. The captive amount of shrimp and other sea food products are limited. In the future the trade in fish commodities will increase as well as especially the developing countries will consume a much greater share of the world's fish in the future. This fish consumption is increasing by 57 percent, from 62.7 million tons in 1997 to 98.6 million tons in 2020. This high demand will not be meet by capture fisheries alone due to overcatching and decreasing wild stocks. It will be only feasible if aquaculture production will increase significantly. In the past couple of decades, however, aquaculture has boomed significantly (Tidwell, 2001).

The production of sufficient food for the population has many advantages in the short, medium and long term including purposes of food security, creation of employment, preservation of resources, and savings on foreign currency reserves. On whether aquaculture can close the fish demand gap, it may be said that while it would not be able to close the gap completely, it certainly can substantially narrow it. Several issues have to be considered: human population growth trends, enhanced production from capture fisheries, availability of more natural resources for aquaculture, greater demand for fish proteins, government policies and legislations, domestication and genetic improvement of cultured species and environmentally sustainable culture technology.

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