

Poisoning the Environment: Impacts of Shrimp Farm Operations

Once shrimp ponds become operational, there are a host of ecological impacts generated with devastating consequences for the effected environment and human communities in the area. Pollution from shrimp farming has severe side effects for local people who inhabit and use the surrounding environment to maintain their food supplies and subsistence economies. Shrimp ponds demand large and continuous supplies of fresh and salt water and thus use local water resources with great intensity. Shortages of fresh water have resulted in many shrimp producing areas such as southern Thailand and Tamil Nadu, in India. In Taiwan, substantial land subsidence causing tens of millions of dollars of property damage occurred due to extraction of well water used to dilute coastal shrimp ponds.

To maintain the overcrowded shrimp population in intensive production systems, and attain higher production efficiency, copious amounts of artificial feed, pesticides, chemical additives and antibiotics must be continuously added. These compounds, together with excrement from the shrimp, makes the wastewater from the ponds poisonous. The polluted wastewater is generally pumped back into the surrounding environment in order to save costs, poisoning coastal waterways and the sea, fresh groundwater supplies, native flora and fauna, and adjacent communities. In addition shrimp pond effluents are often high in organic matter, with a resulting high biological oxygen demand that can cause oxygen depletion in receiving waters. The combination of surplus organic matter and increased salinity from pond effluents can cause severe problems, especially for fish populations and other sea life that inhabit the receiving waterways. Saltwater in the ponds also seeps into the local groundwater and the increased salinity damages drinking water supplies and surrounding agriculture land, making alternative cropping (such as rice) nearly impossible.

As with other types of farming, shrimp farming frequently uses exotic species and varieties that are not indigenous to the local area. What effects the introduction of new species will have on the local ecosystem is not yet known. Even if an exotic species of shrimp can be contained in the ponds to which they were introduced, and even though it may appear to be innocuous, there is always the danger of diseases and parasites spreading to local shrimp species. Cultured shrimp, especially in intensive cropping systems, are highly vulnerable to a wide assortment of parasitic fungi and virulent bacteria and viruses, and if these pathogens spread to a local shrimp or invertebrate fishery they can produce serious economic and ecological consequences.

Perhaps most significantly, the conversion of coastal ecosystems into mono culture production areas can have disastrous long term effects. The life span of an intensive shrimp farm is between five and ten years (many are forced to shut down within 3-5 years after choking on their own self-generated pollution) - once the farm is abandoned it is expensive and difficult, if not impossible, to rehabilitate the land for any other purpose (e.g., farming, replenishment of destroyed mangrove forests). This, in itself, is an immense problem. In Ecuador 15 percent of shrimp farms are now unusable while in Thailand less than five percent of the initial farms set up in the Gulf of Thailand (Thailand's first shrimp growing region) remain in operation today. The bottom soil of an abandoned shrimp pond that has been used for intensive culture is usually too saline for agriculture or other uses, so the destruction of land by shrimp farming, may for practical purposes, be irreversible.

The treatment of bacterial infections in shrimp ponds with doses of various antibiotics added to shrimp feed could lead to the occurrence of high levels of antibiotics in marketed shrimp, and this could conceivably increase antibiotic resistance in human consumers. As a result, the U.S., for example, has imposed tight inspection controls on imported shrimp, turning back shipments that register excessive levels of antibiotics. A related environmental issue with potential implications for humans is that since shrimp ponds are downstream from agricultural lands, pesticides may accumulate in shrimp tissue as well. Harmful pollutants that are frequently present in estuaries where shrimp farms operate -- for example, radioactive isotopes and heavy metals - can also occur in shrimp tissue.

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The environmental impacts of shrimp aqua culture do not occur in isolation, but are a part of a complex of coastal threats emanating from industrialization, urbanization, increased use of agricultural chemicals, recreational and tourism development and petroleum exploitation. Coastal areas are especially susceptible because they are downstream from sources of urban and agricultural pollution. In addition, large urban centers are often on or near the coastline, and the compounding environmental stresses reduce the capacity of the coastal environment to absorb the damaging effects of shrimp farming.