

2. Shrimp Farming - Production and Consumption

2.1. The Basics of Shrimp Farming

Cultivating edible fish and other marine species in both freshwater and marine environments

is a traditional food production method, particularly in southeast Asia where 'backyard'

fish ponds provided valuable protein to complement vegetables, rice and other grains

produced on the surrounding lands. In some countries, such as India, Bangladesh and

Thailand, there is a tradition of a rice/shrimp rotating system, with rice grown part of the

year and shrimp and other fish species cultured the rest of the year. In such low-yielding,

'natural' ponds the harvest was small but sustainable over long periods. The 'catch' most

likely, was for family consumption or sold in local markets. Such systems have become known

as extensive systems, and contrast starkly with the modern mode of production which rely

heavily on chemicals, antibiotics and processed feeds.

Long standing, sustainable tradition is being transformed by modern, commercially oriented,

high-output, intensive culture processes that are causing severe environmental damage.

Although there are still many of the more traditional style aqua culture farms in production

in such countries as India, Indonesia, Vietnam, Bangladesh, the dominant trend during the

past decade has seen most farms built as either semi-intensive or intensive operations. As

the extensive style has given way to intensification and industrialization, the degree and

extent of environmental damage intensifies too. Because the species of shrimp being

mass-cultivated on farms live naturally in warm-water marine environments, commercial shrimp

farms are located along tropical and sub-tropical coastlines within easy pumping distance

from the ocean or tidal inlets. Indeed, site selection is one of two principal management

considerations in shrimp farming, the other being concerned with how to maximize the

efficiency of rearing juvenile shrimp to market size. The outcomes of both these decisions

have tremendous effects on the type and extent of consequent environmental damage.

Shrimp are farmed in large ponds, usually dug to a depth of at least one meter, and the pond

levees are formed either by hand or by earth moving equipment. Normally the site will be on

an estuary or next to a coastline to provide a source of brackish or saltwater. A shrimp

culture pond can be a converted extensive coastal fish pond, a large rice paddy area or land

producing other agricultural crops, salt flats, or a newly excavated site in a clear-felled

mangrove forest. It is in situations like these where the construction of shrimp ponds does

the initial damage to the environment, stripping natural or existing farmed landscapes bare.

Lured by profits, investors in shrimp farming have been moving to even greater levels of

intensification in order to dramatically increase rearing of juvenile shrimp to market size.

Instead of relying on natural tidal flows to stock ponds, as the traditional aqua culture

systems have, the more intensive methods of shrimp farming rely on industrialized processes

- for example, the manual stocking of ponds with either wild-caught or hatchery produced

'post-larvae'. Shrimp post-larvae are crammed into these intensive ponds at density rates up

to 100 times greater than the stocking rates of the lower-yield, systems. The higher

intensification requires ponds to be 'fertilized' with urea and triple super phosphate to

stimulate algae growth as food for growing shrimp, but supplemental feeds have become the

norm. Maintaining favorable water quality is an essential aspect of pond shrimp aqua culture

Shrimp are particularly sensitive to low concentrations of dissolved oxygen in the water. In

order to maintain favorable dissolved oxygen concentrations, intensively cultivated ponds

must undergo frequent flushing. Sea and ground water must be also continuously

pumped into

the intensive ponds, and polluted water flushed out. Intensive pond systems may need water

exchange rates of between ten to fifty-five per cent of the pond volume each day just to

keep dissolved oxygen concentrations above critical levels. This water demand places a

tremendous burden on local ground water supplies, rapidly depleting local freshwater

resources. The flushing of brackish and polluted pond waste-water ends up contaminating

adjacent lands and coastal waters.