Sustainable Marine Shrimp Farming

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Abstract

Sustainability can be viewed internationally or within one country at an industry, regional (district) or individual farm level. It can include environmental, social and economic aspects. Major environmental concerns have included intensive modification of coastal environments through pond construction eg mangrove destruction, and the possible transfer or concentration of viruses into wild populations. Social effects include loss of coastal community lifestyles, as coastal land is purchases from more traditional fishing or farming communities, leading to displacement of some community members to urban areas. Shrimp farming has been a spectacularly successful generator of export income in many countries but the frequency of industry crashes has a severely dislocating effect on local economies. An Environmentally Sustainable Development (ESD) framework that has been developed for aquaculture in Australia is presented although it may not necessarily reflect priorities in other countries including Sri Lanka.

Some of the major problems that have been implicated in crashes of shrimp farming industries internationally are discussed and some potential solutions considered. However, it is of course for Sri Lanka to decide on its own development strategies. Issues include; transfer of diseases into countries through introduction of non-native species or imports of broodstock or postlarvae of species that occur naturally in that country, crowding of farms so that discharge from one farm can directly affect the intake to another farm, use of excessively high stocking densities relative to the management skills of farm operators, inappropriate disposal of pond sludge directly into natural waterways, inadequate monitoring of the disease status of postlarvae sold out of hatcheries to a network of farms, excessive use of chemicals and potential transfer of pathogens with inadequately processed feed ingredients.

Solutions include appropriate sterilization of affected ponds, development of captively bred lines with high health status, appropriate industry development and planning strategies, surveillance of imported feed ingredients, use of probiotics rather than antibiotics, avoidance of unfiltered discharge from hatcheries (so that diseased batches are not just flushed into natural waterways, and use of recirculating pond culture systems rather than flowthrough systems. In the short term the future of shrimp farming probably depends on whether farming of *Litopenaeus vannamei* proves to be any more sustainable than farming of *Penaeus monodon*.