

FRESHWATER AQUACULTURE IN THE SG. SELANGOR BASIN



Intensive tilapia culture

Freshwater aquaculture is a significant activity in the Sungai Selangor basin, which not only provides livelihood for the operators, but also fish for the tables, recreation and ornamental fish industry. Freshwater aquaculture obviously requires water of good quality, but the industry also impacts on the quality of water in the river.

There is a concern over possible pollution caused by the discharge of used water from the ponds and the IRBM project therefore asked WWF-Malaysia to study the environmental impact of freshwater aquaculture in the Sungai Selangor basin and to recommend measures to ensure the sustainable development of the industry, including zoning.

MANY TYPES OF CULTURE

Aquaculture activities in the basin are quite diverse. More than 20 species are cultured at 28 aquaculture farms, mainly in excavated ponds and cement

tanks. The two most important species are hybrid catfish (keli) and tilapia.

WATER USE

Most of the aquaculture farms use rivers as their main water source. The river water quality was mostly sufficient for aquaculture, but due to sand mining, silt is a problem and some areas (especially Sg. Sembah which drains the Rawang sub-basin)

are affected by high levels of BOD and ammonium.

DISCHARGE OF USED WATER

The amounts and the quality of the discharged water also varied considerably. Only 13 of the 28 farms were found to discharge used water, and some only in small amounts.

The most polluting farms were rearing catfish, but other catfish farms had only very limited discharge and the wide variation in farm types and culture practices made it difficult to relate the effluent discharges to farm type.

Effluent concentration in itself was not a good indicator of pollution. About 80% of pollution load (in kg/day) was actually due to a single farm practising very high stocking density of more than 50kg/m³, which discharged a high volume of effluent with a modest organic load concentration. When regulating the industry, it is therefore important not to look at concentration alone.



Harvesting catfish

The total discharge of phosphate from aquaculture operations is estimated at 125 t/yr. Compared to the total transport of the river this is insignificant. The discharge of nitrate and sediment is also small compared to other sources. Discharges in connection with harvesting and emptying of ponds are not considered as there are no data to indicate the extent of this.

Although the regular discharge from aquaculture operations in most cases is relatively small, appropriate mitigation measures should be taken to encourage farmers to employ water reuse strategies and wastewater treatment. At present many aquaculture farms in the Sg. Selangor basin employ basic production technologies that do not include sustainable husbandry techniques, water reuse strategies and wastewater treatment infrastructure.

RECOMMENDATIONS

The study team recommended that:

- All farms should either (a) practise zero-discharge or (b) treat the wastewater in sedimentation / oxidation ponds with a retention time of at least 24 hours to ensure that the effluent meets Standard A.
- Hatcheries should be equipped with a two-stage discharge treatment system. The first stage including disinfection to destroy pathogens and feral releases, while the second stage is an oxidation pond with minimum 24 hours retention time.
- Where pond sediments are removed after harvest, they should be stored within the farm before being properly disposed of.

- Where pond sediments are not removed, they must be dried out and tilled to facilitate aeration and then compacted to prevent erosion.
- The discharge outlets should have double screened gates to trap debris and feral organisms.

ZONING

The study team also recommended to gazette aquaculture zones (aquaculture development areas). Such zones could give the industry better protection and perhaps allow the establishment of common treatment facilities for used water.

REGULATION

The team found that the draft Inland Fisheries Rules (Aquaculture) provides a good framework for the industry and should be enacted. Alternatively regulations may be developed using the LUAS Enactment. It was also recommended to develop guidelines for the appropriate freshwater aquaculture systems.

Extracted from: IRBM Updates (Issue 4; January 2006). Malaysia-Denmark joint IRBM project.