

WATER QUALITY ASSESSMENT FOR AQUACULTURE ACTIVITIES IN BANGPAKONG RIVER BASIN

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Agriculture, aquaculture, and livestock are main activities in the Bangpakong River Basin, and aquaculture activity accounts for 15 percent of BOD loading (16,000 ton BOD/year). The aquaculture activities such as shrimp and fish ponds have been rapidly emerged and the discharge of untreated effluents into the river especially during harvesting period can impair water quality. Water quality near the river mouth is frequently in violation of water quality standards. High BOD is especially a problem during summer drought conditions. To address these water quality problems, the water quality model has been applied to predict the water quality in Bangpakong River in both dry and wet season and to identify programs and measures that will help facilitate the establishment of the effluent from aquaculture activities. The database for the calculation of aquaculture organic waste includes effluent concentration using biological oxygen demand (BOD), and effluent volume. Three scenarios were simulated as follows: (i) Untreated effluent directly discharged into receiving water. (ii) Treated effluent and compliant with coastal aquaculture effluent standard (BOD does not exceed 20 mg/L). (iii) Zero discharge or closed system.

The model results indicate that treated effluent (scenario ii) can decrease BOD down about 0.2-0.5 mg/L, and increase DO around 0.1-0.2 mg/L. However, BOD in some river reaches are still higher than surface water quality standard class II (BOD does not exceed 2 mg/L) in both dry and wet season. Meanwhile, the zero discharge scenario can help improve water quality along the Bangpakong River in both seasons. Nonetheless, action plans for non point source pollution should be launched to improve water quality more effectively.