Chapter V

Conclusions and Recommendations

5.1 Conclusions

1. Shrimp diet was a practical substrate, which can be employed to establish nitrifying biofilters within a period of 3 – 4 weeks.
2. The proposed aquaculture systems integrated with shrimp diet acclimated Biocord™ biofilters were effective in maintaining acceptable ammonium and nitrite concentration during the zero-water exchanged aquacultures. The proposed aquaculture systems were able to handle inorganic nitrogen waste as high as 18.3 mg N L^{-1} day^{-1} without performing biofilter cleaning.
3. Inorganic nitrogen assimilation and denitrification were two additional processes that were partially responsible for inorganic nitrogen control in the proposed aquaculture systems. Operation of the proposed aquaculture systems beyond the recommendable aquaculture density of 10 kg m^{-3} (i.e., specified biofilter length = 21.6 m) would lead to the development of various anaerobic processes such as denitrification and sulfate reduction.
4. Periodic biofilter cleanining was suggested as means to maintain an effective nitrification rate and more importantly to prevent the formation of anaerobic metabolites.
5. The proposed aquaculture systems were simple to build and should be attractive towards budget-limited farmers who needed to harvest their crops at the density as high as 30 kg m^{-3}, a level comparable to caged production.

5.2 Recommendation and Contributions

The result from this work suggested the possibility of redesigning closed-water aquaculture systems to combine production and treatment into a single tank. The data also indicated that the proposed aquaculture systems were effective in maintaining low ammonium and nitrite concentrations and were capable of replacing unenvironmental friendly caged production. This work also oriented towards local

Thai farmers, which lacked both financial and technological supports. In the future, efforts should be focused on improving productivity, suspended solid management, and nitrate removal. Moreover, indepth understanding of biological processes taking placed and their interactions to each other should be further investigated.