

**ENVIRONMENTAL IMPACTS OF MARINE CAGE FARM (Lobster
culture) IN VAN PHONG BAY, KHANH HOA, VIETNAM**

HOANG TRUNG DU

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Graduate Faculty of the

**INSTITUTE OF MARINE FISHERIES AND OCEANOLOGY
COLLEGE OF FISHERIES AND OCEAN SCIENCES
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ABSTRACT

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Thesis adviser: Prof. Ricardo P. Babaran

The study carried out two surveys at five sites in lobster cage farming activities, during rainy season (November 2002) and dry season (February 2003). It includes 236 measured data on physical and chemical parameters of water quality, 115 data on sediment characteristics, and 30 macrobenthic samples.

The results of the study indicate that the lobster cage farming activities are related to the accumulation of organic materials on seabed of the cage farm. The impacts of lobster cage farms on water quality might come directly from the cage farm and indirectly from the release of organic and inorganic matter from sediment bottom which significantly changed depending on the season. This could be seen in the total inorganic nitrogen (TIN) concentration at the bottom, which is higher by 6-10 times during the dry season than that during the rainy season. Moreover, cage farming enriches the water column through the release of nutrient and particulate organic matter and affects the sea bottom with deposition of sediment particles. The study clearly marked variation in organic matter and chlorophyll-a concentrations in sediment. In addition, the particulate organic carbon in water samples also showed the negative impact under the cage.

The results of sediment trap exhibited high organic content at stations near the cage (stations 2 and 3) as compared to the station farther the cage and the control site. On the other

hand, organic matter in surface sediment was significantly higher under the cage than in the control site. This suggests that accumulation of organic material under and near the cage is highly deposited by particles that come from the cage farm.

There were observed changes in benthic community in terms of species, abundance, and biomass. Changes in benthic composition were different between stations near the cage and the control site. This indicates that benthic community patterns were affected under the cage and those near the cage farming activities. Macrobenthic communities were dominated by polychaete species during the two surveys. Polychaetes represented more than 55% of benthic abundance as well as greater than 60% of the number of species.

This study shows that it may be possible that some polychaete species such as *Magelona sp*, *Myriochelle sp*, can be important bio-indicators of heavy organic load in the cage farms. On the other hand, polychaete species *Prionospio aficana*, *Orbinia vietnamensis* might be considered as candidate indicator species for detection of organic enrichment in the cage farms. In addition, these can serve as baseline information for future studies to evaluate environmental impact of cage farm. The relationship and interaction between factors that cause eutrophication is therefore particularly important for future studies.