

# Result of Preliminary Studies on the Impact of the Tsunami on Fisheries and Coastal Areas of Penang and Kedah in Malaysia

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A meeting was held on 28 February 2005 at the Fisheries Institute, Penang, to discuss results of current research projects on the impacts of the tsunami. C.P. Ean, R. Siow and M. Ali from the Fisheries Research Institute have made a compilation of the eleven papers presented under the title Interim Report on the Impacts of Tsunami on Fisheries and Coastal Areas. The following provides a brief summary of the conclusions.

## Bacterial levels in seafood

There were fears that seafood might become contaminated following the tsunami due to increased levels of pollutants, from either sediment re-suspension or run-off and/or increases in bacterial and viral concentrations from damaged wastewater systems. In order to ease public concern, the Department of Fisheries conducted a survey to examine the levels of indicator bacteria in seafood. Twenty-one samples were collected from landing jetties and cage culture sites around Penang on 7, 8 and 11 of January and tested for total and fecal coliform numbers, and the presence/absence of *Salmonella*, *Vibrio cholerae* and *Vibrio parahaemolyticus*. The results did not show specifically high levels of indicator bacteria. Although some high fecal coliform counts were observed in cockles from Kuala Juru, higher levels had also been recorded prior to the tsunami (Wan Norhana et al. 2005).

## Pulau Payar Marine Park coral reefs

The marine park lies north of Penang and south of the Langkawi Islands, off the west coast of Malaysia. A SCUBA survey was carried out on 17-18 January 2005 to study the impact of the tsunami on the coral reef structure. Three randomly placed 20 meter transect lines were surveyed at three separate reef locations in water depths of 3-8 meters. The survey followed internationally accepted standard procedures to record percentages of hard corals, dead corals, broken coral, coral rubble and abiotics. The results of the survey indicated that the tsunami caused only negligible damage to the coral reefs in the marine park (M.P. Abdullah 2005).

## Benthic populations in Kedah waters

A survey was carried out in January 2005 to determine the effects of the tsunami on benthic population structures off the coast of Kedah state. Eleven stations were sampled between 5 and 12 nautical miles offshore using a Smith McIntyre grab. Results were compared with a previous study conducted in the same area in June 2004. Interestingly, the survey showed an increase in density and diversity of macrofauna at sites closer to the coast and a decrease in density and diversity further offshore. The dominant taxa present had changed from polychaete to crustacean. However, although the tsunami may have influenced the changes in macrobenthos, this cannot be verified

because there is not enough seasonal data on benthic populations to draw such a conclusion (R. Siow 2005).

## Mangrove/seagrass ecosystems and physico-chemical parameters

A study was carried out at two tsunami-affected sites, Kuala Terian in Pulau Langkawi and the Sungai Merbok estuary (including the Tanjung Dawai and Pantai Merdeka areas) from 14-29 January 2005. The objective was to determine the degree of impact on various physico-chemical parameters (ammonia level, oxygen concentration and Total Suspended Solids) as well as on substrates and mangroves. The damage to mangroves was considered slight or minimal at both study sites. The thickness of sediment deposits in the inter-tidal mangrove zone was 1.0-3.5 cm. High concentrations of ammonia were recorded (exceeding 0.02 ppm). This could be linked to the presence of high Total Suspended Solids. However, samples from two non-impacted control sites also showed ammonia levels exceeding 0.02 ppm (A.H. Alias et al. 2005).

## Comparison of pre- and post-tsunami fish resource surveys

A number of surveys were carried out in January and February 2005 in an attempt to determine whether the tsunami had a measurable effect on local fisheries resources. Results from trawl

sampling along a transect line westwards from Kuala Kedah crossing the Pulau Payar Marine Park area showed that the abundance of demersal fish and prawns were within normal or current exploitation levels. The data from this sampling was compared to results obtained in May and October 2003. The difference between them could be attributed to normal seasonal variation (A. Man 2005).

Results from a separate study 12 nautical miles to the southwest of Penang Island showed significant differences from a previous study. A total reduction in catch of 32% and a decrease in the proportion of demersal finfish and prawns in the total catch. However, as the previous study was made in a different season and four years earlier, no relationship with the tsunami can be inferred (A.T.Ahmad 2005).

Fisheries catch and effort data is collected by local fisheries offices at selected landing sites. The data for December 2004 and January 2005 from the fish landing complex at Tanjung Dawai, Kedah, were compiled and analyzed (C.P. Ean 2005). In the days immediately following the tsunami, very few vessels were operating and catch landings were small. Data suggests that areas that were hit hard by the waves and operate primarily with small and traditional fishing gear (boats <10 GRT), such as Kuala Muda and Yan,

were more severely affected than areas where larger trawlers operate. No clear changes could be observed from the data and a longer period of monitoring will be required to determine if there is a measurable change in species composition or catch per unit effort.

## References

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