

**OT-1 Studies on Mercury Pollution in the Amazon, Brazil  
(Final Report)**

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**Total Budget for FY1993-FY1995** 77,830,000 Yen (FY1995 32,713,000 Yen)

**Key Words** Mercury pollution, Amazon, Methylmercury, Gold mining, River system

Gold mining activities are widespread in the Amazonian region and the potential contamination by mercury(Hg) used for collecting alluvial gold has become a matter of great concern in recent years. The work reported here was undertaken to evaluate the actual extent of Hg contamination and its health effects mainly in the Tapajos river basin where can be considered the oldest and most productive gold mining are in the Amazon in collaboration with the Federal University of Rio de Janeiro.

The results obtained in the present study are as follows:

- (1) Simplified and highly sensitive analytical procedures for the determinations of T-Hg and MeHg in various different types of samples containing Hg down to background levels were established.
- (2) Analysis of hair samples from gold miners and goldshop workers clearly showed that they were contaminated with inorganic Hg as well as MeHg. Thus, analysis solely for T-Hg is not sufficient, and MeHg should be determined in areas where the contamination with both inorganic Hg and MeHg can occur as in the Amazon.
- (3) The inhabitants of fishing villages near the main gold mining areas were more exposed to MeHg than those far downstream. About 3% of hair samples collected from 559 individuals were found to have MeHg levels greater than 50 ppm, the minimum threshold value for MeHg intoxication, and the highest levels was 137 ppm. and widespread contamination with MeHg in the Tapajos river basin.
- (4) The longitudinal Hg analysis of long hair samples indicated that the inhabitants of fishing villages were exposed continuously to MeHg at least over the last few years to the present time with fairly constant levels, and even a slightly increasing trend for some of them, with a seasonal variation.
- (5) The MeHg levels of fish from most of the upstream area and some of downstream are exceeded Brazilian allowable limit of 0.5 ppm.
- (6) A highly significant correlation between Hg in hair and blood was found in fishing villages and the overall average ratios of hair Hg and blood Hg were very close to 250, generally established for MeHg, presenting that the people living in fishing villages were primarily exposed to MeHg through fish consumption, with very little confounding exposure to inorganic Hg.
- (7) A significant correlation was also observed between total mercury or inorganic Hg in urine and inorganic Hg in blood from the individuals working in goldshop. This significant correlation would suggest the possibility of predicting the contamination level of inorganic Hg in blood in each individual from Hg level in urine.