Mercury Pollution Due to Small-Scale Gold Mining in the Philippines: An Economic Analysis

by:

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I. Introduction

- Small-scale mining is defined as “mining activities which rely heavily on manual labor using simple implements and methods and do not use explosives or heavy mining equipment.” (RA 7076)

- Small-scale gold mining has been the target of strong opposition in recent years because of its various environmental and social side-effects, foremost of which is mercury pollution.

II. Review of Related Literature

- Foreign studies investigated small-scale gold mining in Brazil. High levels of mercury pollution were found in small-scale gold mining areas of the Amazon region.

- In the Philippines, several studies also looked into mercury pollution in Diwalwal, the largest small-scale mining site in the country.

III. Objectives and Data

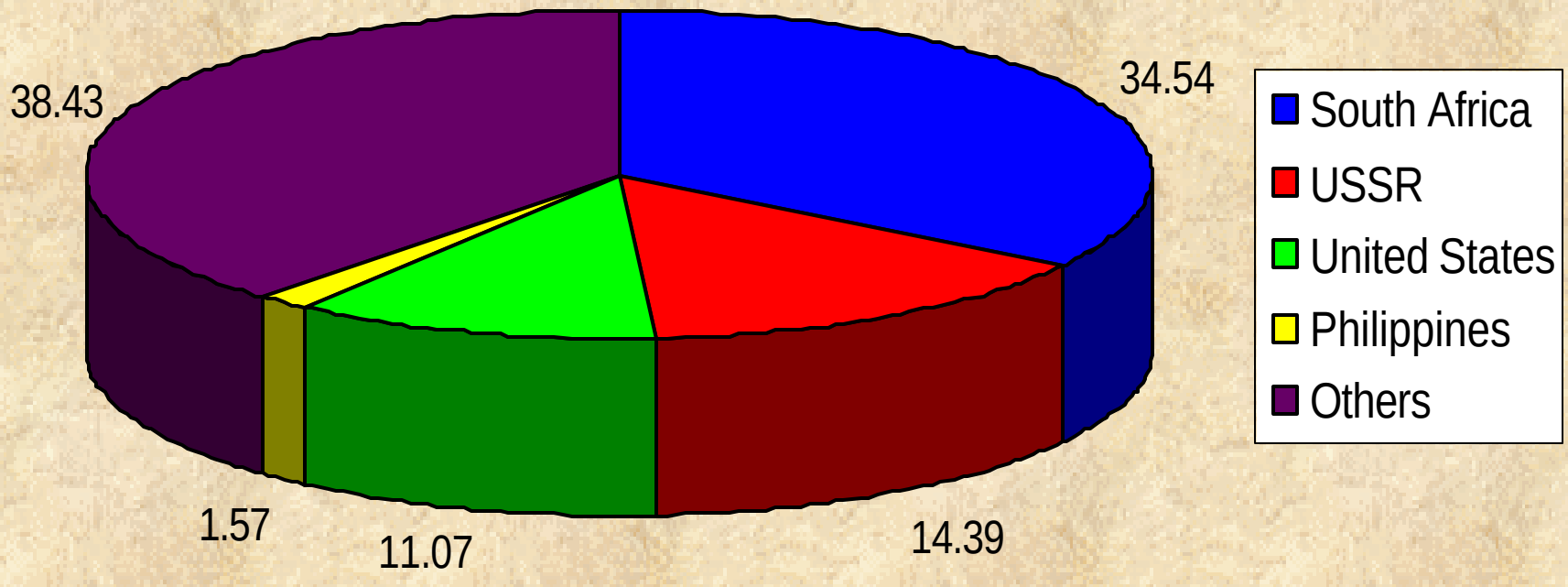
- The main objective of the study is to review small-scale gold mining in the Philippines and quantitatively assess, to the extent possible, the economic cost of mercury pollution.

- The study also discusses the other environmental and development problems associated to the activity. The end purpose is to suggest measures to address them for better management.

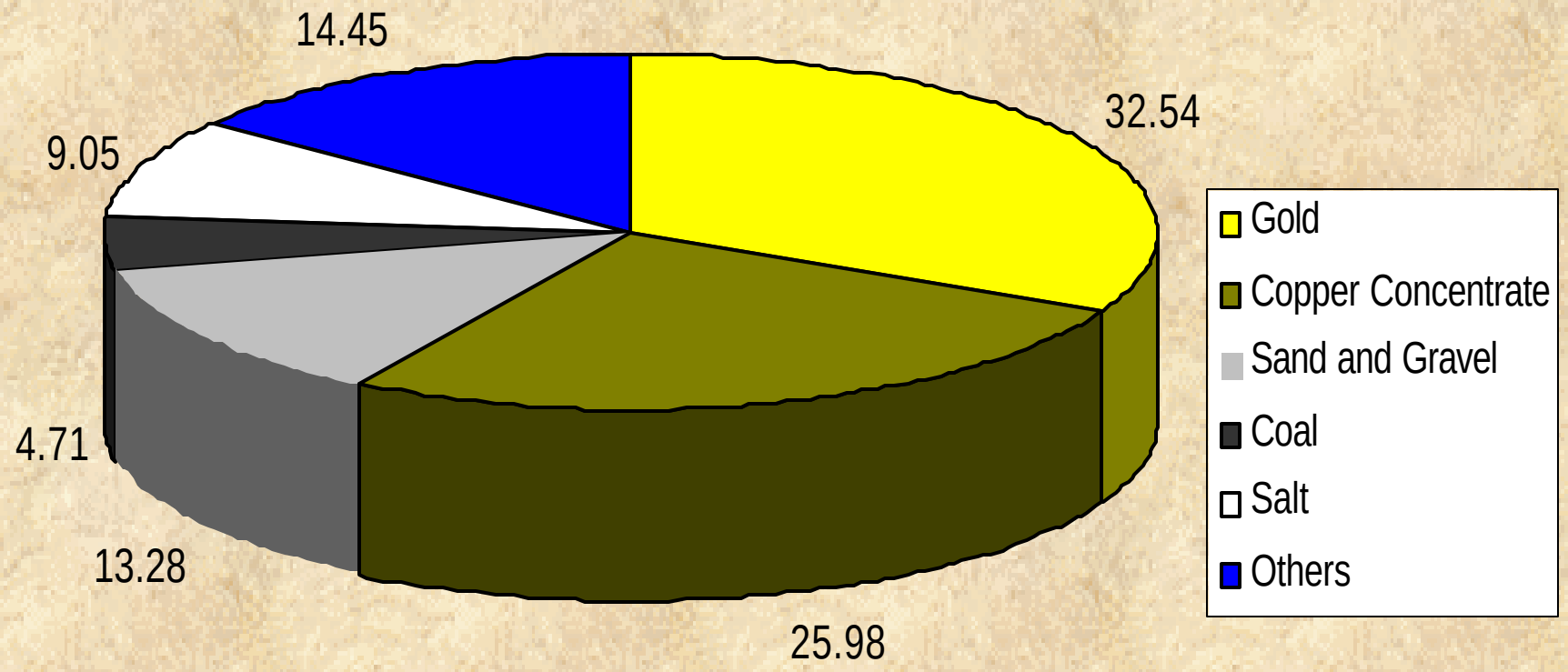
IV. Review of Small-Scale Gold Mining in the Philippines

A. World and Philippine Gold Production

Average Annual Quantity of Gold Production, by Country, 1980-1997 (in Percent)



Average Annual Value of Mineral Production of the Philippines, 1980-1997 (in Percent)

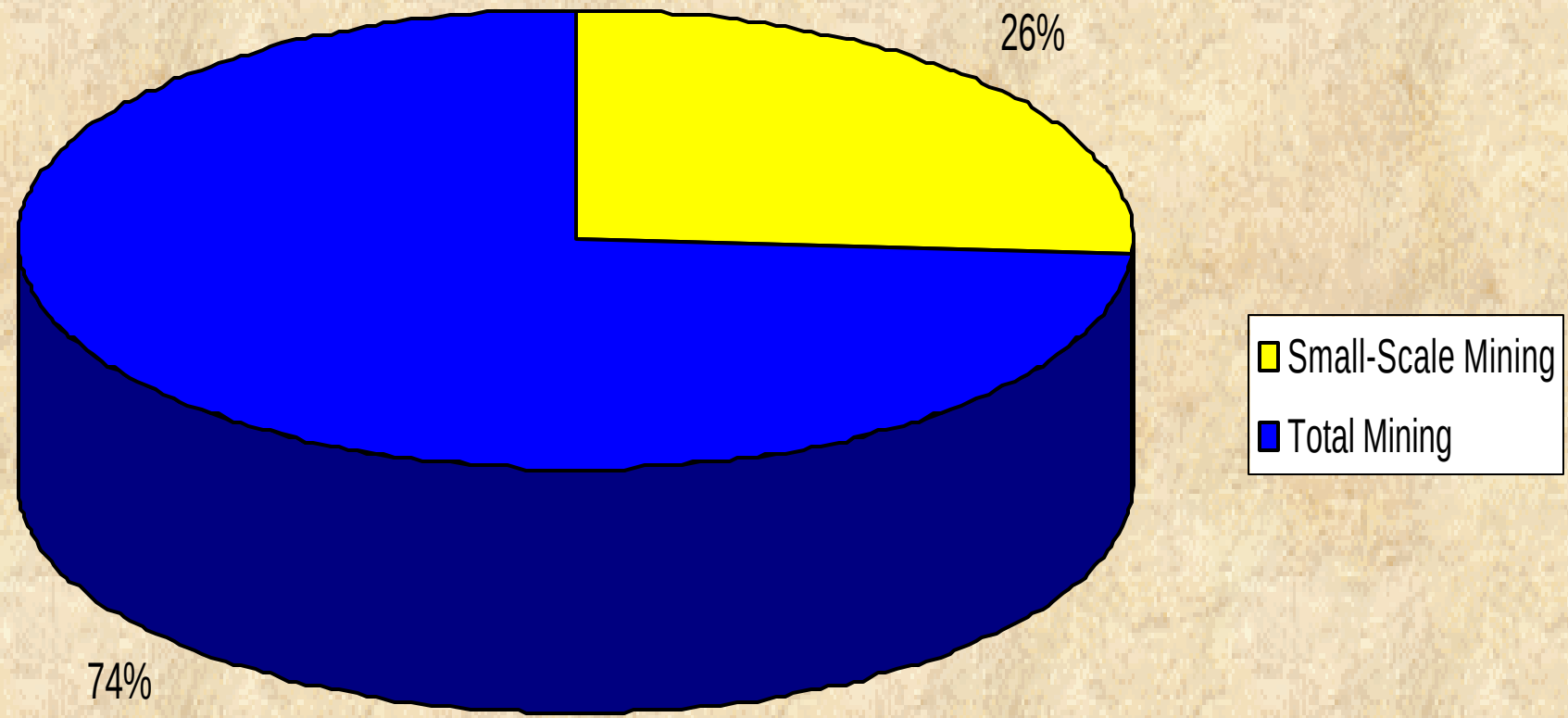


B. The Philippine Small-Scale Gold Mining Sector

Figure 1. Distribution Map Showing Different Small-Scale Gold Mining Areas in the Philippines

ource: Javelosa (1997)

Production Contribution of Small-Scale Mining to Total Gold Production in the Philippines, 1992



- Bayle (1995) estimated that 250,000 people were directly engaged in small-scale mining. Dhar (1994) figured out that about 400,000 to 500,000 people were in one or another involved in it.

V. Mercury Pollution Due to Small-Scale Mining

A. The Amalgamation Method

- Mercury gets into the picture in small-scale mining because it is the main agent used to separate the gold from the mined ore employing the amalgamation method of processing.

B. Channels of Mercury Pollution

- mercury is unintentionally spilled into the ground because of careless handling.
- mercury is discharged together with other wastes into inadequate tailings ponds or thrown directly into rivers and waterways.
- vaporized mercury is released into the atmosphere when the amalgam is blowtorched and refined.

VI. Case Studies

- Diwalwal, Monkayo, Compostela Valley
- Panique, Aroroy, Masbate
- Tugos, Paracale, Camarines Norte

Figure 5. **Map of Compostela Valley Province Showing the Municipality of Monkayo and the Barangay of Mt. Diwata**

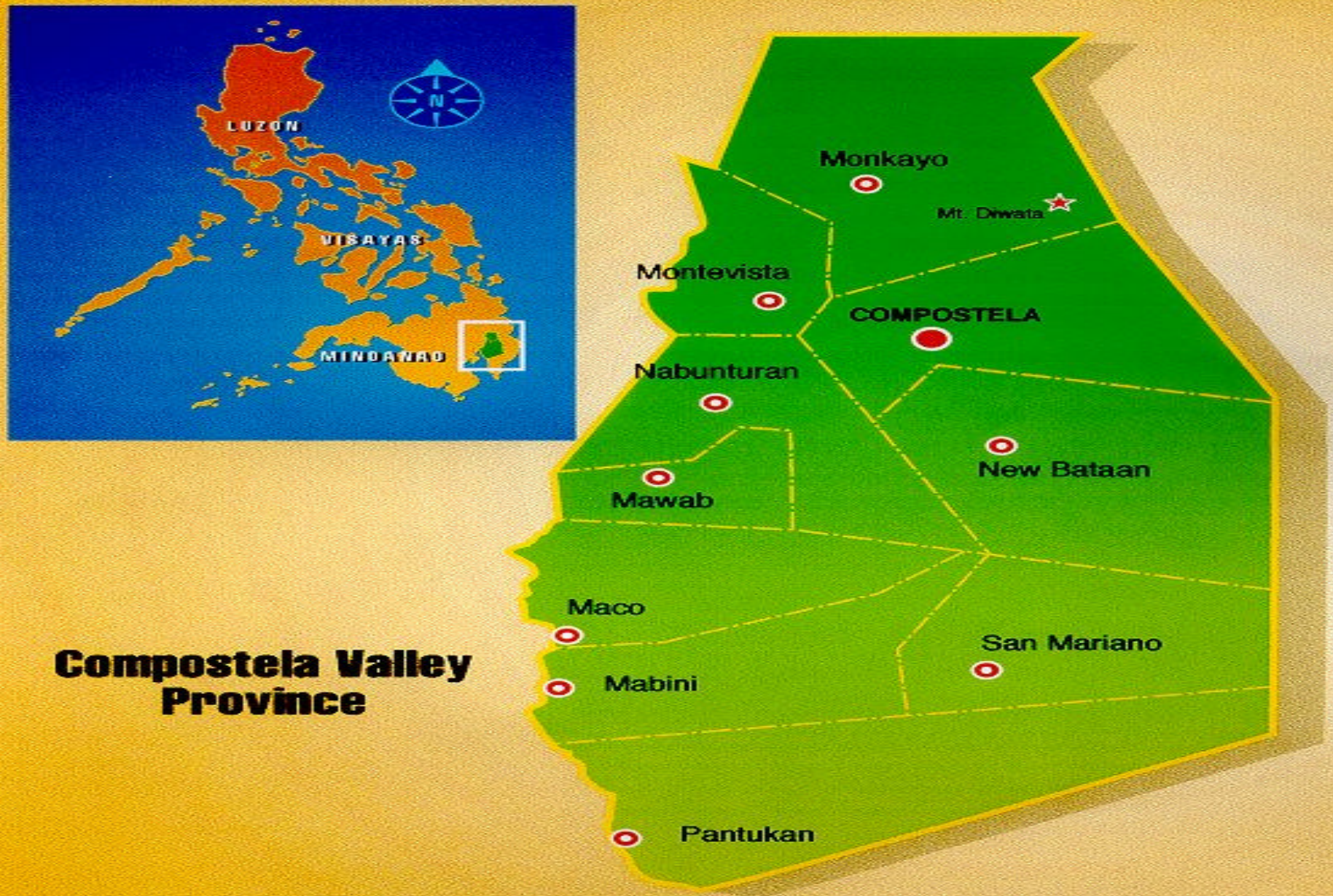


Figure 6. Map of Masbate Province Showing the Municipality of Aroroy and the Barangay of Panique

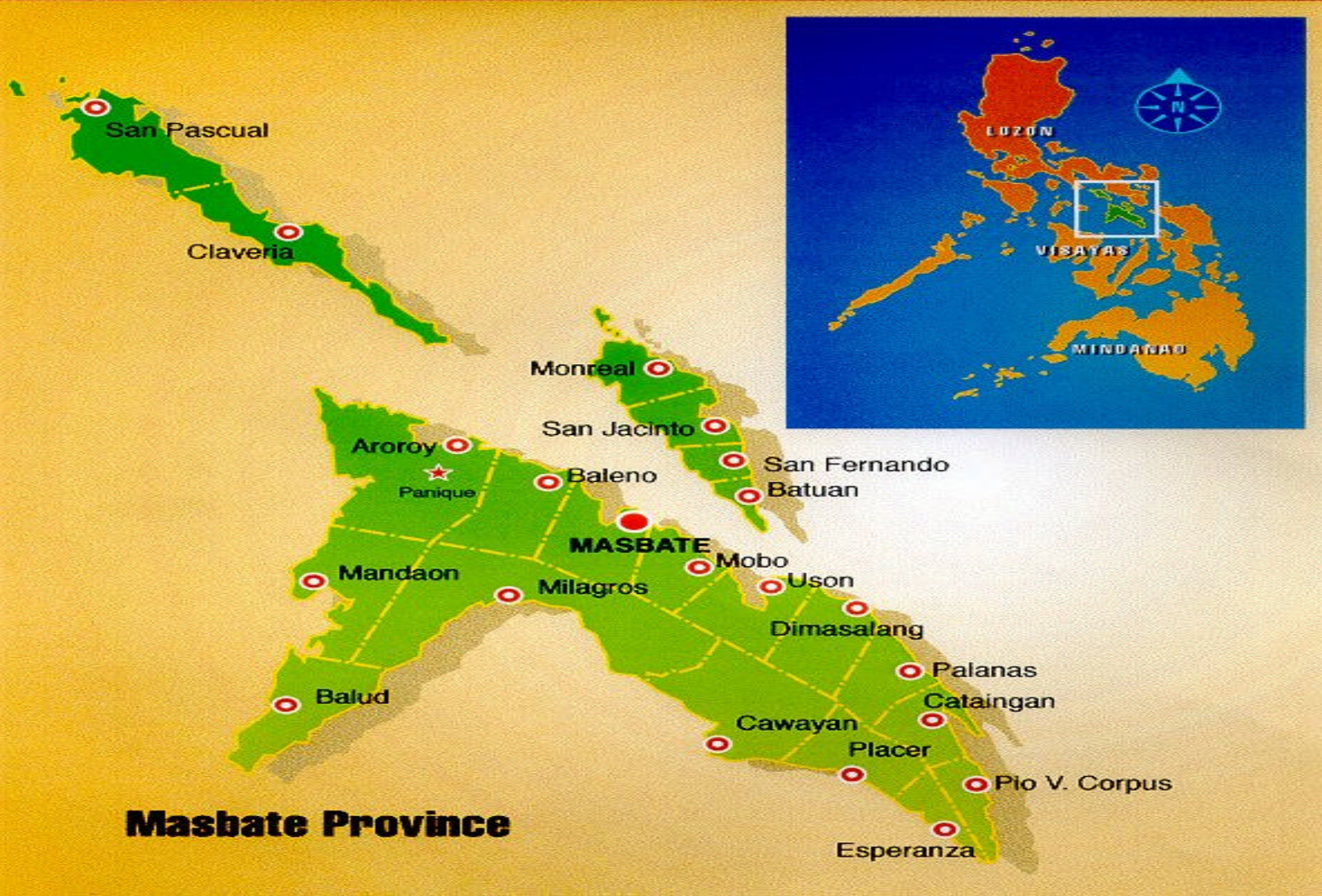
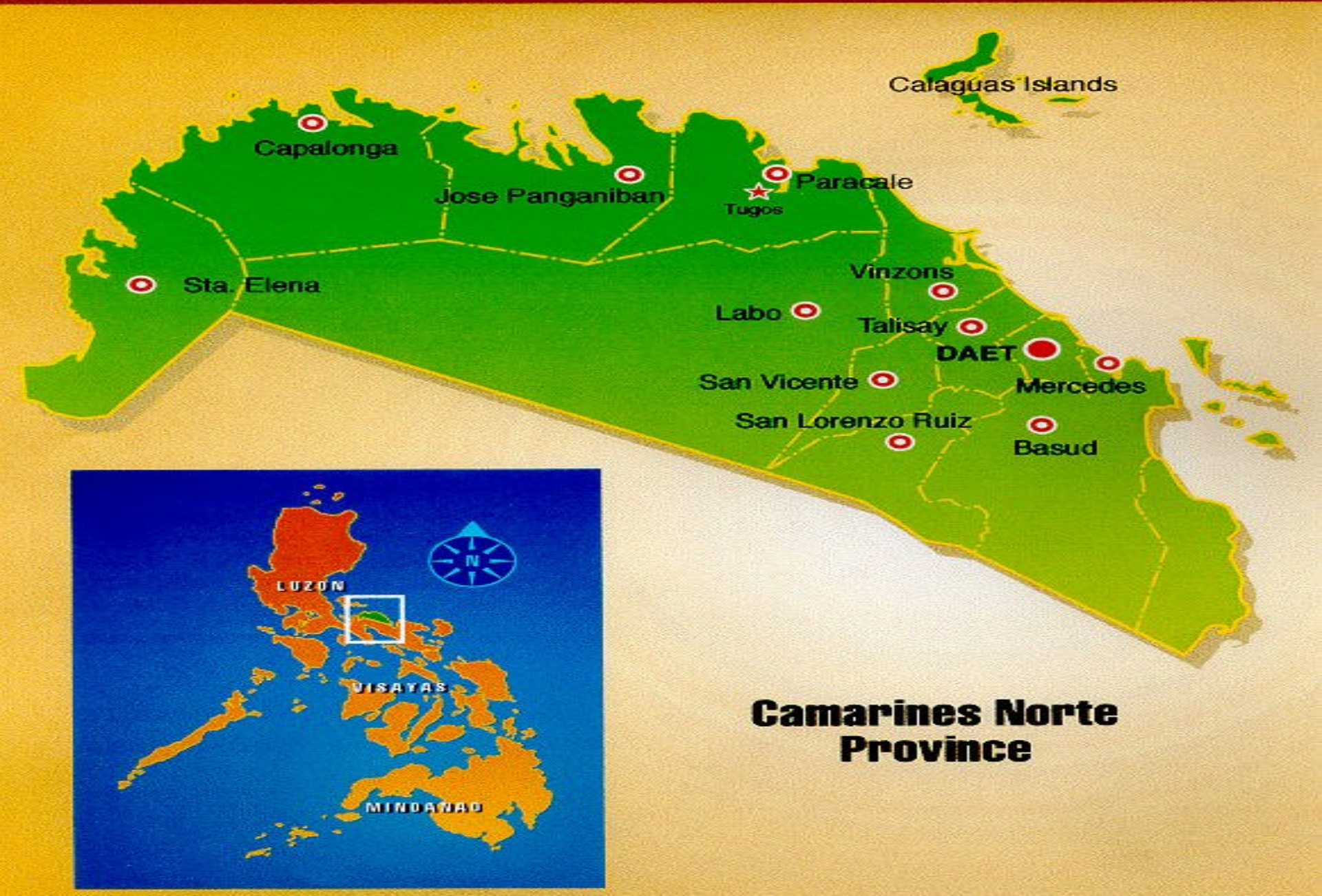


Figure 7. Map of Camarines Norte Province Showing the Municipality of Paracale and the Barangay of Tugos



VII. Findings

- Hand gloves, mercury retorts and tailings ponds are the preventive expenditure items in the containment of mercury pollution due to small-scale mining.
- The estimated total cost of the gloves for miners involved in amalgamation numbering about 215,000 in the entire country is P 107.5 million.

- Under certain assumptions, the estimated annual cost of putting up mercury retorts nationally is P 37 million.

- Under certain assumptions, the estimated total national cost of impoundment nationally is about P 986.5 million.

VIII. Recommendations

- Licensing of all small-scale gold mining and processing operations within their jurisdiction and imposition of membership in a cooperative as a licensing requirement.

- Earmarking of the licensing proceeds for the establishment of a small - scale mining monitoring and enforcement unit within the management framework of LGUs.

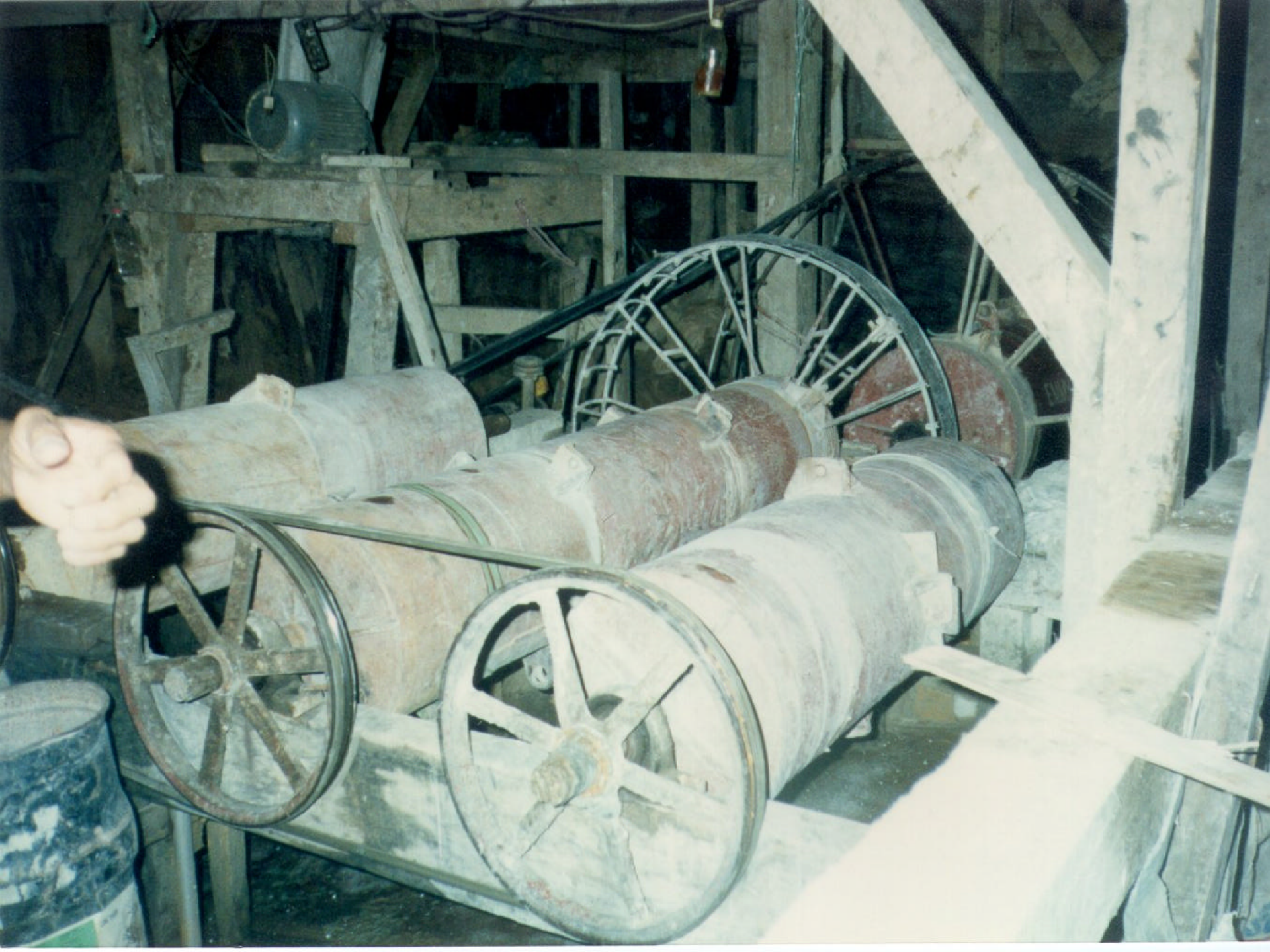
- Development of an effective internal system within cooperatives that will force the proper use of hand gloves, mercury retorts and tailings ponds in small-scale mining.

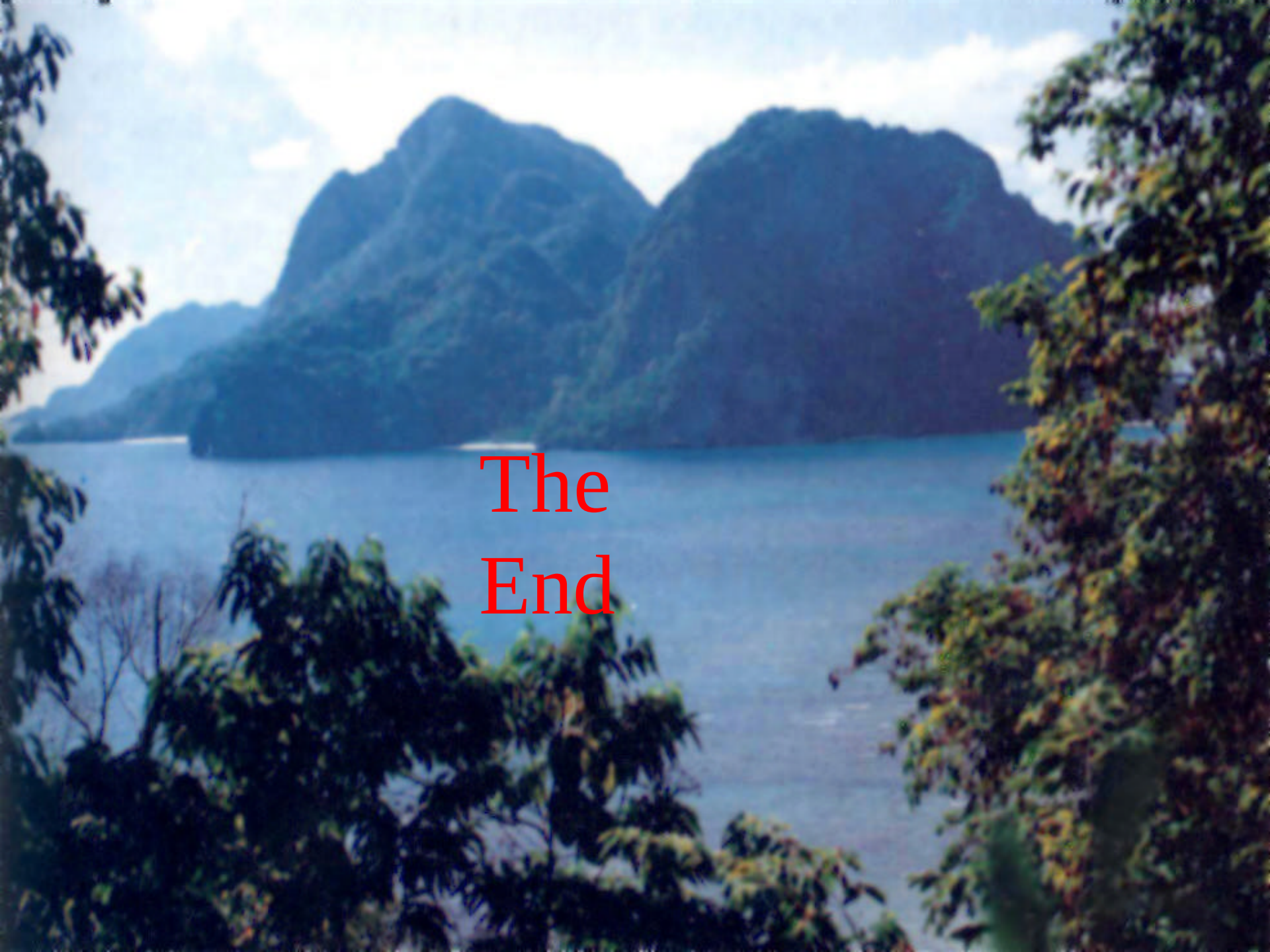
- Active involvement of Non - Government Organizations (NGOs) and other members of the population in monitoring and enforcement by deputizing them.

IX. Conclusions

- Despite the seriousness of mercury pollution, worsening poverty ensures that small-scale mining is here to stay.

- Legalizing the activity by licensing miners will help improve environmental management.

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