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Regional Capacity Building Program for Health Risk Management of Persistent Organic Pollutants (POPs) in South East Asia



Final Economic Valuation Report for
Air Hitam Sanitary Landfill Case Study Site in
Puchong, Selangor, Malaysia

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Canadian International
Development Agency

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**REGIONAL CAPACITY BUILDING PROGRAM
FOR HEALTH RISK MANAGEMENT
OF PERSISTENT ORGANIC POLLUTANTS (POPs)
IN SOUTH EAST ASIA**

**ECONOMIC VALUATION REPORT FOR THE
AIR HITAM SANITARY LANDFILL CASE STUDY SITE
IN PUCHONG, SELANGOR, MALAYSIA**

Final Report

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LIST OF ACRONYMS

AHSL	Air Hitam Sanitary Landfill
BCR	Benefit Cost Ratio
CBA	Cost Benefit Analysis
CEA	Cost Effectiveness Analysis
CIDA	Canadian International Development Agency
COPC	Contaminants of Potential Concern
DALY	Disability Adjusted Life Year
GNI/capita	Gross National Income per capita
HPT	Hatfield Project Team
IRR	Internal Rate of Return
Lao PDR	Lao People's Democratic Republic
NRE	Ministry of Natural Resources and Environment
NPV	Net Present Value
PPP	Purchasing Power Parity
PV	Present value
OECD	Organization for Economic Cooperation and Development
POPs	Persistent Organic Pollutants
POPs Project	Regional Capacity Development Program for Management of Health Risks of Persistent Organic Pollutants in South East Asia
VSL	Value of a Statistical Life
WTP	Willingness-to-Pay

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The revised report was prepared by Ms. Nelly Maublanc and Mr. Dave Williams from the Hatfield POPs Project Team, with contribution and supervision by Mr. Thomas Boivin, POPs Project Manager and Mr. Sokhem Pech, POPs Project Assistant Manager.

EXECUTIVE SUMMARY

The enclosed report for the *Regional Capacity Building Program for Health Risk Management of Persistent Organic Pollutants (POPs) in South East Asia* (POPs Project) provides an economic evaluation for the project case study in Malaysia – the Air Hitam Sanitary Landfill (AHSL) site in the State of Selangor.

As the National Focal Point for the POPs project in Malaysia, the Ministry of Natural Resources and Environment (NRE) in consultation with key stakeholders selected the Air Hitam Sanitary Landfill (AHSL) site in the State of Selangor for the POPs Project human health risk assessment case study. The AHSL site is located near the Air Hitam Forest Reserve in Mukim Petaling, Daerah Petaling, Puchong, Selangor and is located at longitude 101° 39' 55" E and latitude 03° 0' 10" N.

The overall goal of the economic analysis was: to develop and implement a simplified economic evaluation process to help decision-makers assess whether implementing risk management measures at POPs-contaminated sites represents a sound allocation of public resources; and, to assess whether the benefits expected from such mitigation measures would, at a minimum, cover the costs.

Conducting an economic analysis of the impact of POPs contaminants is a challenging process. While common sense suggests that there may be many benefits from a remediation effort, the cause-effect relationships that link the removal of POPs contaminants to the ensuing human health and environmental benefits are not scientifically established. Supporting data, especially site-specific information, tend to be scarce. Nonetheless, the application of accepted economic practices and the use of professional judgment enables us to make rough estimates and draw valuable conclusions in the limited data setting of the project.

Modifications to the standard Cost-Benefit Analysis (CBA) process were necessary to overcome the data limitations. A modified approach was developed which calculates the minimum health benefits required to cover the cost of implementing proposed risk management scenarios for POPs hotspots.

This modified approach included the following:

- The Disability Adjusted Life Years (DALY) approach was used for the valuation of human health benefits;
- The value of a DALY in Malaysia was estimated by using benefit transfer to convert the value of a DALY in the U.K. to the Malaysia situation;
- The number of DALYs at the hot spot sites were estimated based on the national DALY rates (per 100,000 people) calculated by the WHO and the number of potential receptors assessed by Hatfield during the risk assessment conducted at the AHSL site; and

- The cost estimates for the risk management scenarios were based on a number of assumptions including engineering measures that have not been subject to detailed design, and unit prices determined through desktop study. The cost estimates may be refined in future when site-specific and nation-specific input parameters are available.

Two risk management scenarios have been proposed: Scenario 1 - Assessment of Potential Human Health Risk; and Scenario 2 - Which consists of Scenario 1 plus hazard containment and monitoring. The costs (present value) of implementing these scenarios are estimated to range between US\$ 119,000 and US\$ 546,000.

Based on the economic analysis, the minimum benefits required to cover these costs is between 0.3 and 1.3 DALYs “saved” each year. In relative terms, these benefits represent a reduction of total DALYs among the population of between 0.03% and 0.1% per year.

The analysis concluded that the implementation of Scenario 2 is justified from an economic standpoint on the basis of quantified human health benefits alone. As a hazard assessment without mitigation measures, Scenario 1 generates no positive human health impact *per se*; the return on investment in Scenario 1 occurs when a hazard is confirmed and contained in Scenario 2. Neither Scenario requires the inclusion of other economic, environmental and social benefits. The estimation of these benefits, which was beyond the scope of this study, would serve to further justify the investment in containment.

Should the decision be made to proceed with risk management policies at the local and national level, attention and studies should focus on ensuring that the proposed measures are designed and implemented in a sound and cost-effective manner.

Finally, decision makers must also consider the fact that health improvement policy can be pursued regardless of the outcome of the economic assessment. Decision-makers may take into account other social, political and humanitarian factors when deciding on appropriate risk management for the AHSL site. This is often the case in developed countries where uncertainty in the determination of costs and benefits cannot be used as an excuse for inaction or omission. Furthermore, there are moral and ethical reasons to insist on investments that improve human health on the grounds that it is in the public interest and, as a result, outside of any economic consideration.

DISTRIBUTION LIST

The following individuals/firms have received this final document:

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