THE ECONOMIC EVALUATION OF AIR POLLUTION IMPACTS AND CONTROL

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Introduction

South East Asian countries were badly affected by smoke haze caused by land and forest fires from July to October 1997. Since 1980, six major haze episodes were officially reported (Hassan et al. 1998a). The 1997 haze episode was the worst ever experienced by the country. The worst hit area was in Kuching during the periods of 16 to 28 August and 11 to 26 September 1997. For the country as a whole, the worst haze occurred during 11 to 26 September 1997. The haze began to retreat and the intensity has reduced from around 2 October for Sabah, 29 October for Sarawak and 30 October 1997. The severity and extent of the smoke haze pollution were unprecedented, affecting some 300 million people across the region. Among the important sectors severely affected were air and land transport, shipping, construction, tourism and agro-based industries. The haze pollution had also resulted in considerable health impacts to the people and the long-term health effects are yet to be determined. This project provides some preliminary estimates on the economic costs of haze-related damages to Malaysia.

Materials and Methods

The study reviews existing methods of quantifying and evaluating the damage cost of air pollution and assessing the applicability of these on the Malaysian environment. The evaluation was based on the concept of Total Economic Value (TEV) of a resource. TEV consists of use value (UV) and non-use value (NUV). Use values can be broken down into direct use value (DUV), indirect use value (IUV), and option value (OV) or potential use value. Various methods have been used to estimate the damage costs of air pollution particularly those that are related to exposure of high level of suspended particulate matter (Hassan et al. 1998a, b, c).

Results and Discussion

Effect on Health:. One practical measure related to the effect on production is the value of human output lost due to ill health or premature death. Those people exposed to the haze face health threatening impacts. The signs and symptoms of the adverse effects of the haze include itchy sensation in the throat, and coughing, difficulty in breathing and nasal congestion, painful and watery eyes, runny noses and cold attacks, itchy skin, and chest pain. The approach used to obtain the quantitative health damages is by using a dose response function which was developed earlier by Ostro to provide a relationship of how much illness does a given dose of haze pollution cause impacts to health. The health effects due to haze or suspended particulate matter that were assessed include respiratory hospital admission, emergency room visit, restricted activity day, bronchitis in children, asthma attacks for adults and children, and chronic bronchitis. Preliminary assessment has shown that the total health effects due to the 1997 haze episode were estimated to be around RM129 million with a lower bound estimate of RM36 millions and higher estimate of RM258 millions.

Effect on Production: The haze can result in various production losses of economic activities including a reduction in crop yields resulting from reduced sunlight; a reduction in fishing effort due to reduced visibility; a reduction in industrial and commercial activity due to delays in transporting inputs and outputs; loses incurred by the tourism industry; and losses incurred from airport closures due to poor visibility.

Aggregate Economic Value of the Impacts of Haze: The estimated value of the haze damage to Malaysia during the months of July to October 1997 was estimated to be RM794.3 million. Some of the estimates were undervalued and thus have been reassessed. These include the estimates on the impacts of haze on health, aviation industry and the abatement costs incurred. The new estimate on the impacts of 1997 haze was around RM913.91 millions. These include short-term health damages (RM129 million), industrial production losses (RM393.5 million), tourism industry losses (RM318.5 million), airline and airport losses (RM21.81 million), fishing decline (RM40.6 million), and expenditure on abatement in terms of cloud seeding, fire fighting facilities and extra surveillance by monitoring agencies (RM10.5 millions).

Conclusions

Preliminary assessment has found that air pollution in Malaysia is increasingly transboundary in nature. The 1997 haze was a clear case of the effects of forest fires from a neighbouring country. This is a classical external effects in which the activity of one country gives an effect to another country in which that effect was not accounted for in the polluting country. This study has shown that the external costs of air pollution due to haze was significant. Preliminary estimates of the 1997 haze impacts were around RM794 million. This study has provided a higher value of around RM913 million. These estimates are still preliminary and subject to a more thorough and rigorous evaluation.

References

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