

B-15 Development of the Asian-Pacific Integrated Model (AIM) to Evaluate Policy Options for Stabilizing Global Climate

Contact Person Tsuneyuki Morita, Head of Global Warming Response Team,
National Institute for Environmental Studies, Environment Agency
Onogawa 16-2, Tsukuba, Ibaraki, 305 Japan
Tel:+81-298-51-6111(ext.393) Fax:+81-298-58-2645

Total Budget for 1991-1993 134,196,000 Yen (FY1993; 46,464 Yen)

Key Words Global Climate Change, Asian-Pacific Region, Simulation Model, Greenhouse Gas Emissions, Deforestation, Global Warming Impacts

The objectives of this study are to develop the Asian-Pacific Integrated Model (or AIM for short), so that policy options for stabilizing global climate, particularly in the Asia-Pacific region, can be assessed from the two perspectives of reducing greenhouse gas emissions and avoiding the impacts of climate change. AIM is an integrated 'top-down, bottom-up' model with regional models and a major global model. There are currently only four such models in the world.

The three linked models are an emission model, a climate model, and an impact model. The emission model combines an end-use energy model and a technological selection model. More than 100 technologies are evaluated for their potential to improve energy efficiency, and energy demand estimates are linked to a top-down economic model. One component of the emission model is the forest resources alternation model to estimate the global greenhouse emissions from land-use changes. The climate model was created by developing original linkages to join other established models, such as the box-diffusion oceanic model, the IPCC radiative forcing model, the GCM for regional climate change model and the AMAC model for atmospheric composition. The impact model has a spatial water balance model, an ecological matching model and a malaria distribution model. Other related models are being developed.

The outcomes of this study are as follows:

1. A preliminary global module of AIM has been completed;
2. A prototype model of the country-wide emission model has been developed and applied to Japan, China and Indonesia;
3. Integration and application of the country-wide and global models, plus preparation and analysis of emission reduction policies and future global climate scenarios;
4. Three kinds of impact models have been developed - a spatial water balance model, an ecological matching model and a malaria distribution model;
5. The impact models were used to estimate the increased risk of droughts, floods, vegetation changes and malaria;

This study will be developed as a collaborative project with various countries in the Asian-Pacific region beginning in the 1994 financial year. It is expected that the model will continue to be used to analyse the suitability and efficiency of policies to counter global warming impacts in the region.