

ISAM Model Results for Phase II

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Methodology for the Attribution Calculations:

Time Frame:

Emission start and end dates 1890 and 2000

Historical Emissions:

CO₂: Historical emissions based on CDIAC. Future Emissions based on IPCC SRES A2 Scenario.

CH₄, N₂O: Historical emissions based on EDGAR database. Future Emissions based on IPCC SRES A2 Scenario.

Countries/Regions

The four groups of countries are considered: OECD90, REF (Eastern Europe and Former Soviet Union), ASIA, and ALM (Africa and Latin America).

ISAM Model Parameters

Reference ISAM model parameters are used, which were also used for the IPCC TAR calculations and UNFCCC phase I assessment exercise. Ranges of ISAM model parameters are described in the carbon cycle chapter of IPCC WGI TAR and Kheshgi and Jain (2002). A brief description of the various components of the ISAM was provided with the description of UNFCCC Phase I results.

Attribution Calculations

Step 1: Calculated global mean concentrations, radiative forcings, temperature change and sea level rise (G)

Step 2: Calculated concentrations, radiative forcings, temperature and sea level changes by assuming one of the regions (i) emissions zero over the time period 1890-2000 ($G - Reg_i$, where $i = 1, 4$)

Step 3: The relative contribution (RC_i) for a given region (i) is then calculated based on the simple linear scaling method:

$$RC_i = (G - Re g_i) * \frac{G}{\sum_{i=1}^4 (G - Re g_i)}$$

The sum of all RC_i is equal to global value G , i.e.,

$$G = \sum_{i=1}^4 RC_i$$

Results Provided

ASCII Files:

- (1) Cumulative emissions for CO₂ (fossil fuel and land use), N₂O and CH₄.
- (2) Concentrations for CO₂, N₂O, and CH₄.
- (3) Total radiative forcing (CO₂+CH₄+N₂O+Aerosols), Temperature change and sea level change (only the thermal expansion component).

Graphical Results:

- (1) Attribution calculation results for temperature change
- (2) Attribution calculation results for sea level change (only the thermal expansion component)

Reference

Kheshgi ,H.S. and A. K. Jain (2002): Projecting future climate change: Implications of carbon cycle model intercomparisons, *Global Biogeochemical Cycles* (in press).