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Atmospheric Modelling Systems for Southeast Asian Region

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Atmospheric Modelling Systems have been set up on 3 High Performance Computing (HPC) environments in the Southeast Asian Region. Weather Research and Forecasting with Chemistry (WRF- Chem) model, various versions from 3.5.1 to 3.9.1, has been implemented over regional domains; 1) stretching across 5000 x 4500 km centred at Kathmandu, 2) covering parts of Karakolum mountains and Hindu-Kush Himalayas in Northern Pakistan, 3) extending from Myanmar to Thailand and Indochina. The chemical transport model has been used for making assessments with the attempt to understand atmospheric processes and eventually forecast the air pollution episodes, not only during the winter seasons in Nepal and northern India, such as persistent fog or smog, but also the interaction between atmospheric chemistry and South Asian Monsoon, focussing on the monsoon onset dates and precipitation trends on the mountains, during recent past. Meteorological data from routine observation from each country are compared with meteorological output of the WRF simulation for each time periods, so to find the best fit microphysics, short and long-wave radiation parameterization and boundary layer schemes. Preliminary finding is that WRF-Chem is suitable for the region, provided that the emission inventory is improved to capture the actual activities. Only then the modelling systems become useful for supplying the necessary information to policy makers in the region by generating scenarios on possible mitigation actions within each country or across the region, in order to make a joint implementation plan on the transboundary issues of air pollution.

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