

**Future climate scenarios of rainfall and temperature for Sri Lanka**

B R S B Basnayake\* and J C Vithnaga

*Centre for Climate Change Studies, Department of Meteorology, Baudhaloka Mawatha, Colombo 7*

Uncontrolled fossil fuel combustion and land-use changes taken place particularly during the latter part of the last century have resulted in an increase in the emission of greenhouse gases, enhancing the greenhouse warming. The Intergovernmental Panel on Climate Change (IPCC) has worked out several emission scenarios that are possible under different socio-economic conditions up to 2100 as given in their Special Report on Emission Scenarios (SRES) (IPCC, 2001). The Panel has projected increases of global mean temperatures in the range of 1.4 – 5.8 °C by the year 2100 corresponding to these emission scenarios, using Global Circulation Models (GCM).

In general, GCM outputs have coarse resolution of about 300 km, and these are not fine enough to represent small islands like Sri Lanka. Therefore downscaling of the GCM outputs into a finer grid is needed to obtain climate projections over Sri Lanka. In this study, a new set of software on Integrated Assessment, referred to as SimCLIM and developed by the International Global Climate Change Institute (IGCI) of University of Waikato, New Zealand, has been used to downscale the GCM fields into a finer grid over Sri Lanka. The study was carried out for two extreme cases of emission scenarios, and denoted by A<sub>1</sub> and B<sub>1</sub>.

It is clearly seen that the southwest monsoon rainfall, which is usually confined to the western and southwestern parts of the island, is projected to increase by the years 2025 and 2050, under both scenarios. Since southwest monsoon rainfall has shown less variability in the past decades, it is expected that the southwest monsoon rainfall would further increase with less inter-annual variability. Northeast monsoon rainfall, which confines to the eastern and northern areas, projected to be decreased in the future in both A<sub>1</sub> and B<sub>1</sub> scenarios with the increase of inter-annual variability. Therefore dry zone and adjoining areas (intermediate zone) of the island appear to be more vulnerable for drought conditions and this would certainly affect especially the agricultural, water resources and management sectors. Therefore some adaptation measures have to be taken to cope with the future climate change. In the temperature field, maximum and minimum values are projected to increase in the years 2025 and 2050 in both A<sub>1</sub> and B<sub>1</sub> scenarios. The rate of increase of minimum temperature is higher than that of maximum temperature. This would lead to shorter diurnal variation of temperature and this would affect especially the agriculture sector.

Acknowledgement: Financial assistance by GEF/UNEP-AIACC (AS-12) project of Sri Lanka.

\* [senakab@hotmail.com](mailto:senakab@hotmail.com)