6.3.3 Chennai

The GHG emissions of Chennai was 1.7 $MtCO_2e$ in 1975, that escalated to 4.5 $MtCO_2e$ in 1990 and 19.5 $MtCO_2e$ in 2015. A majority of the GHG emissions in 2015 (Figure 6.7, top) were contributed by the energy sector (67%) and industry sector (22%), followed by transport sector (6%) and residential sector (5%). As per the ICLAP model estimates (Figure 6.7, bottom), there would be an increase in emissions at 6.3% per annum, leading to 23.9 $MtCO_2e$ in 2030 and 31.8 $MtCO_2e$ in 2050.

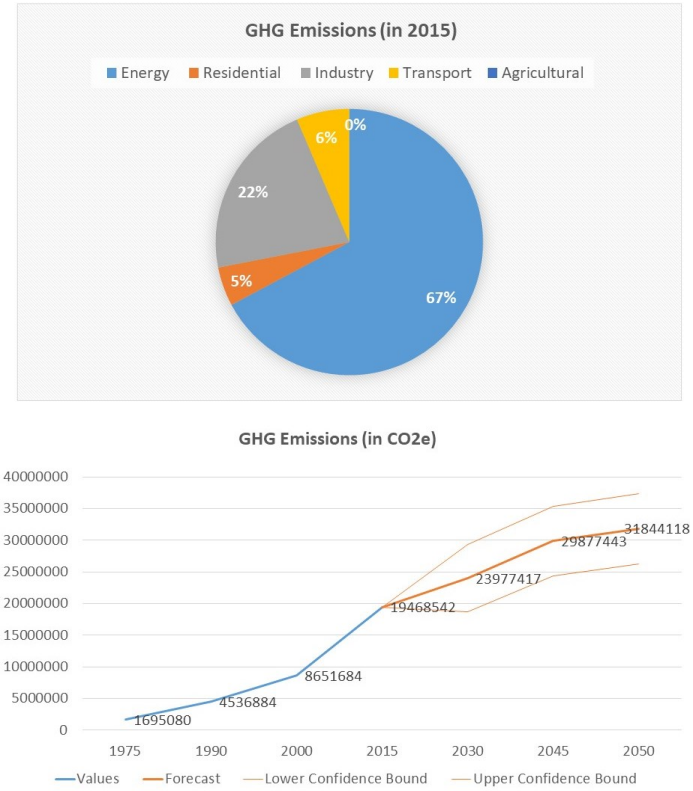

Figure 6.7: GHG contributions from different sectors in Chennai (top); ICLAP model estimates for Chennai's GHG emissions till 2050 (bottom)

The results for climate variability in Chennai indicate that depending on the emission scenarios, there would be a temperature increase of 0.5–2.3 degC from 2030-80s (Figure 6.8, top). The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of 0.5 degC during 2030s (above the 2010 baseline temperature), 0.8 degC in 2050s, peaking to 1.3 degC during 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 6.8 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) exhibits an increase of 0.5 degC during 2030s (above the 2010 baseline temperature), 1.4 degC in 2050s further rising sharply to 2.3 degC above normal up to 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 6.8 (bottom). Meanwhile, the precipitation change for Chennai shows a very high variability in the long run, ranging from -30 to 430 mm from the normal (Figure 6.9, top) depending on the emission scenarios. The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of about 150 mm during 2030s (above the 2010 baseline rainfall), to 430 mm during 2040s, suddenly declining to -30 mm in 2050s, and rising to 250 mm during 2080s.

The spatial results for moderate scenario over 2010-80s are mapped in Figure 6.9 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) shows Chennai's city rainfall increase to around 180 mm (above the 2010 baseline rainfall) during 2030s, rising up to 230 mm in 2050s, dipping to 90 mm during 2070s and resurging to about 430 mm in 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 6.9 (bottom).

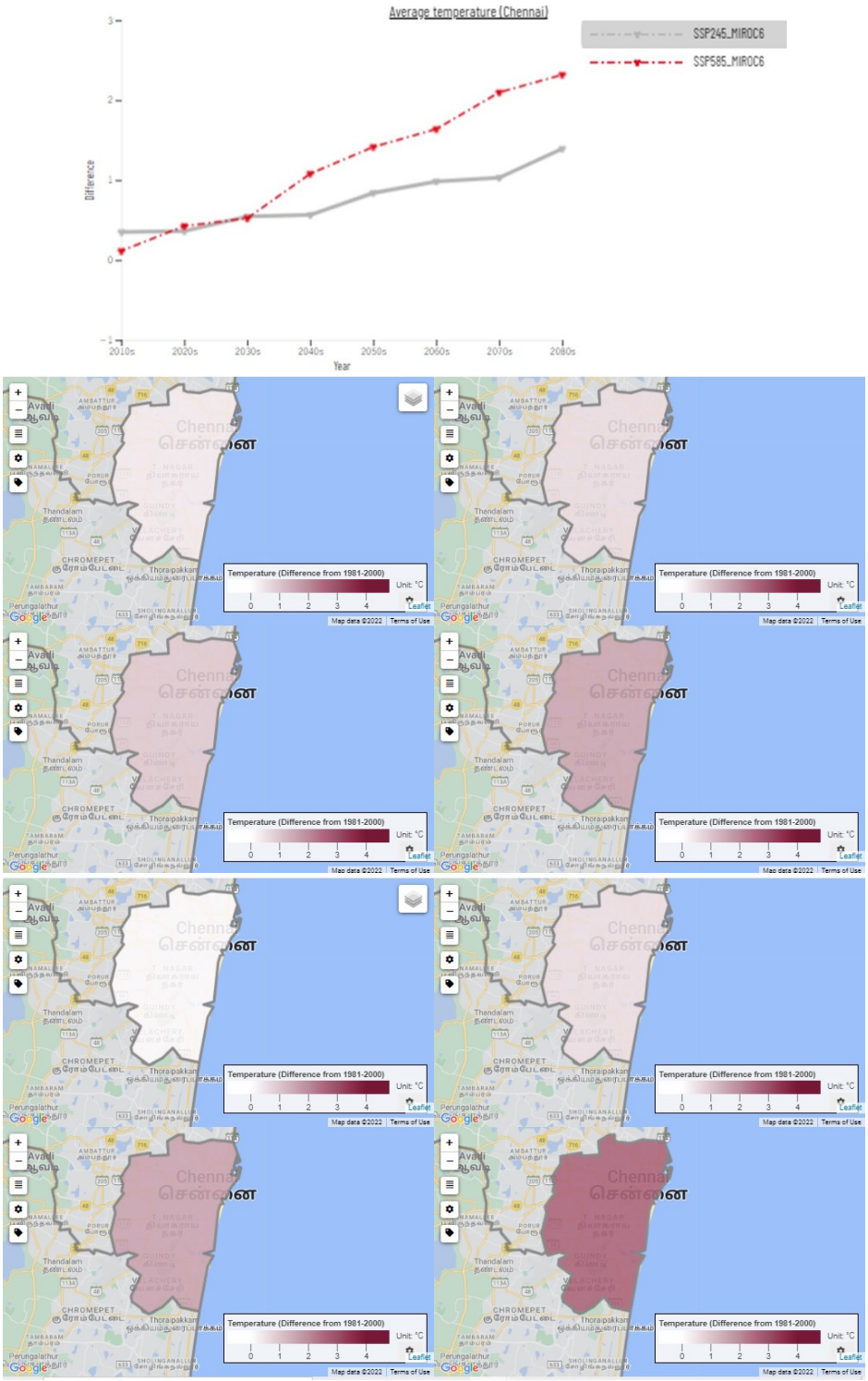

Figure 6.8: Temperature increase in Chennai under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2030s, 2050s, 2080s (bottom)

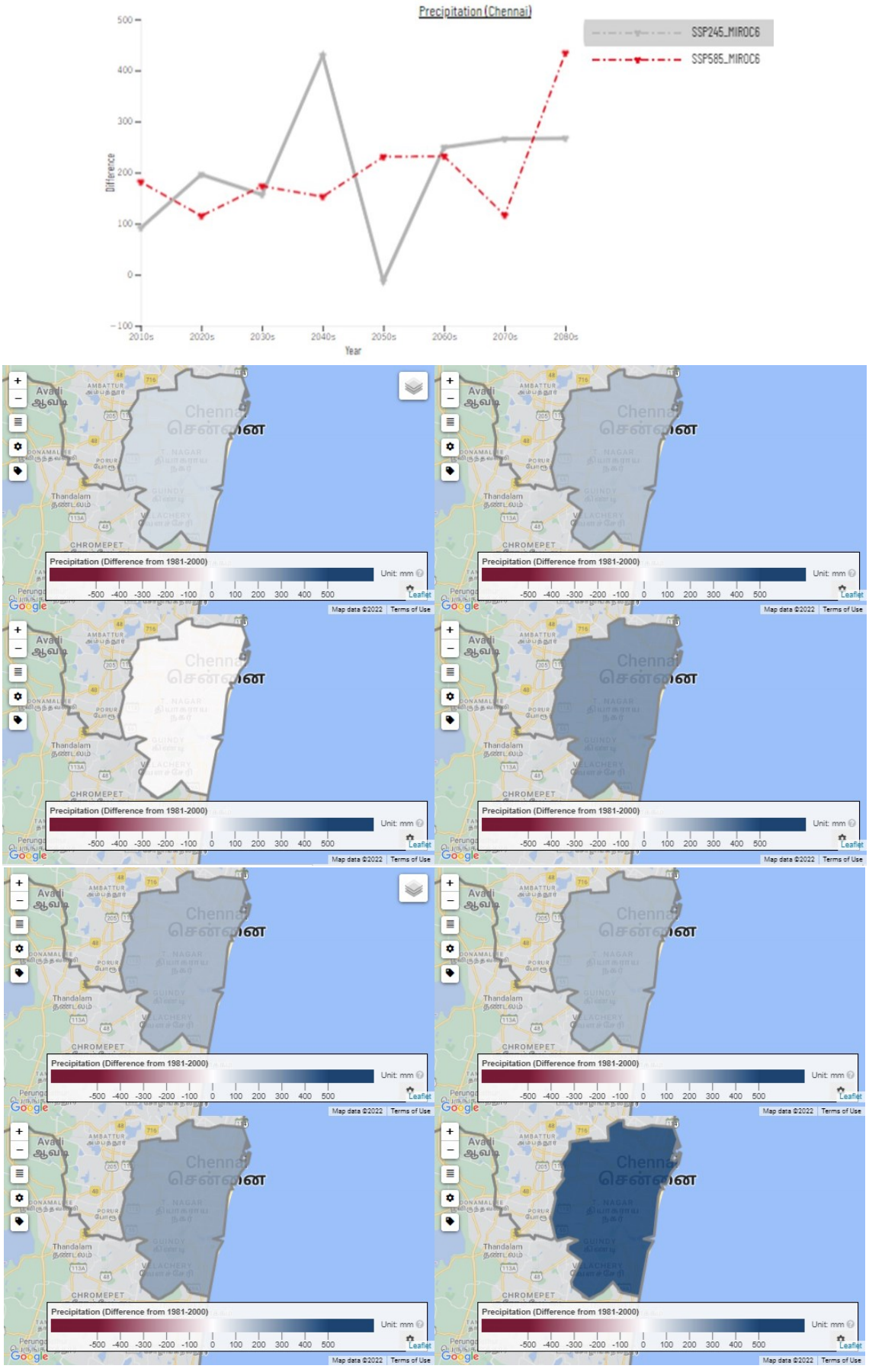

Figure 6.9: Precipitation variation in Chennai under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2030s, 2050s, 2080s (bottom)