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Air pollution reductions caused by the COVID-19 lockdown open up a way to preserve the Himalayan glaciers

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Supplementary Figures

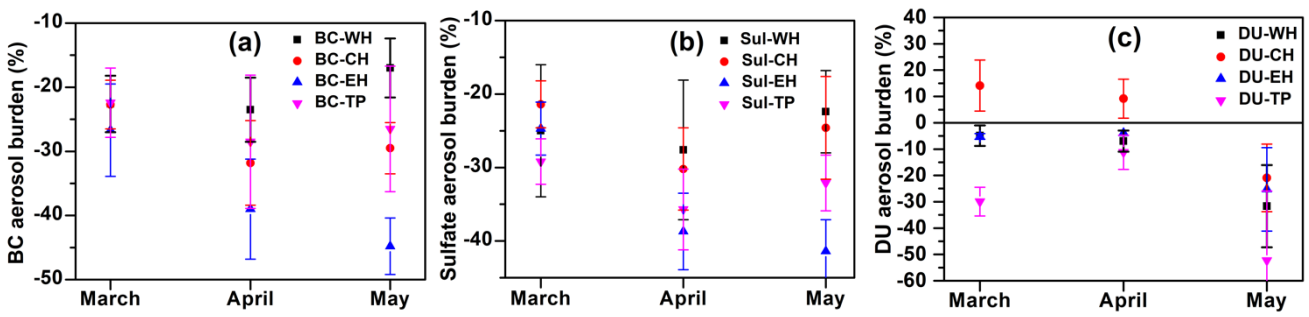

Figure S1: (a) Anomalies (COVID-CTL) of simulated BC burden (%) for March - May 2020 over the Western Himalayas (WH), Central Himalayas (CH), Eastern Himalayas (EH), and Tibetan Plateau (TP), (b) same as (a) but for sulfate burden (%) from ECHAM6-HAMMOZ, (c) same as (a) but for dust burden (%) from ECHAM6-HAMMOZ.

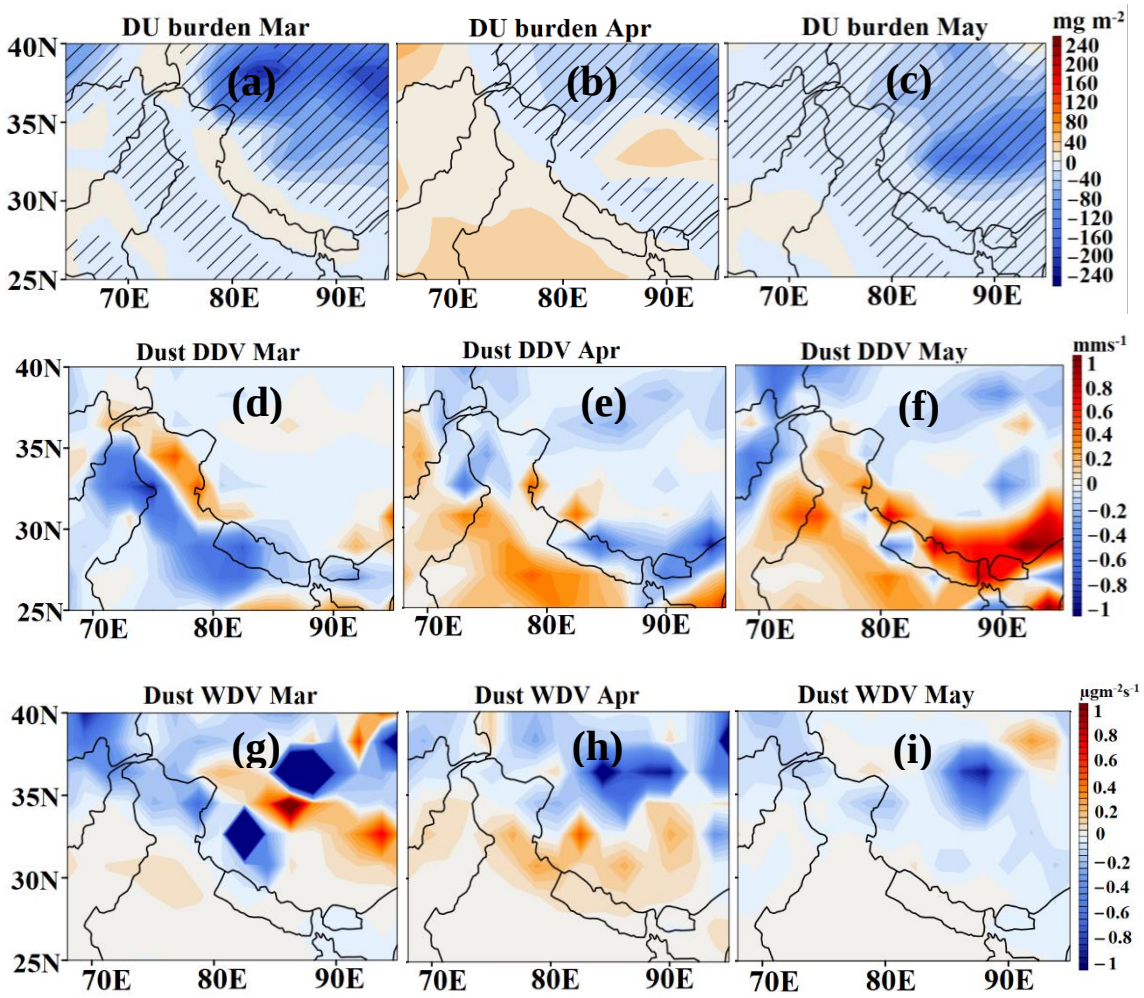

Figure S2: Spatial distribution of anomalies (COVID minus CTL) of atmospheric burden of simulated dust aerosols (mg m^{-2}) (a) March, (b) April, (c) May 2020. Hatched area in Figures (a)-(c) indicate 95% significance level. Spatial distribution of anomalies (COVID minus CTL) of dust dry deposition velocity (mm s^{-1}) (d) March, (e) April, (f) May 2020, (g-i) same as (d-f) but for wet deposition velocity (μg m^{-2} s^{-1}).

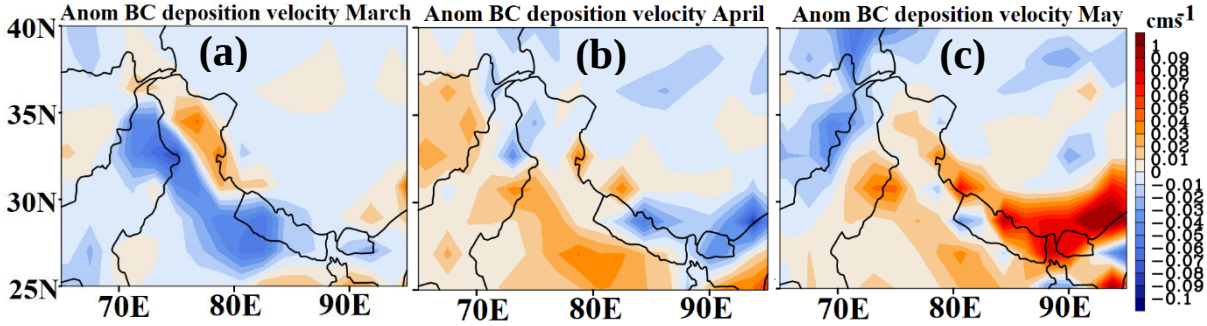

Figure S3: Anomalies (COVID minus CTL) of BC deposition velocity (dry + wet) (cm^{-1}) for (a) March, (b) April, (c) May 2020.

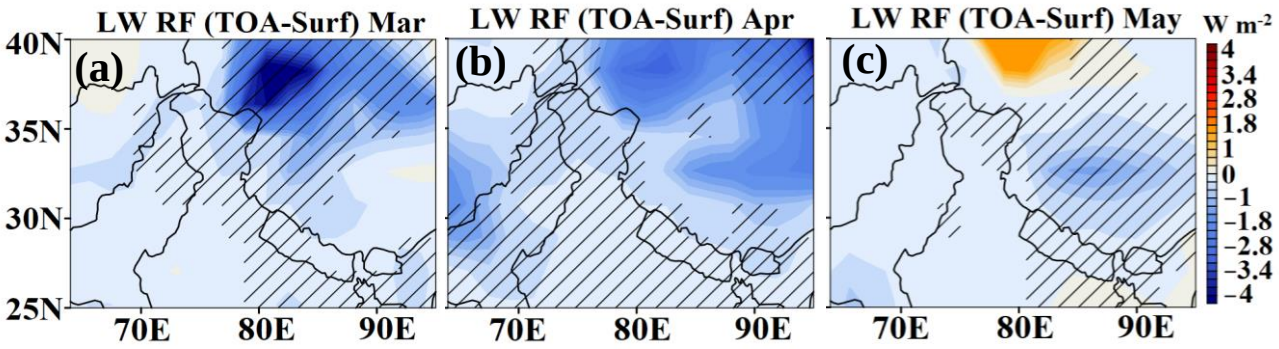

Figure S4: Anomalies (COVID minus CTL) of long wave radiative forcing in the atmosphere (top-of-atmosphere (TOA) minus surface) (Wm^{-2}) for (a) March, (b) April, (c) May 2020. Hatched areas in Figures (a)-(c) indicate 95% significance level.

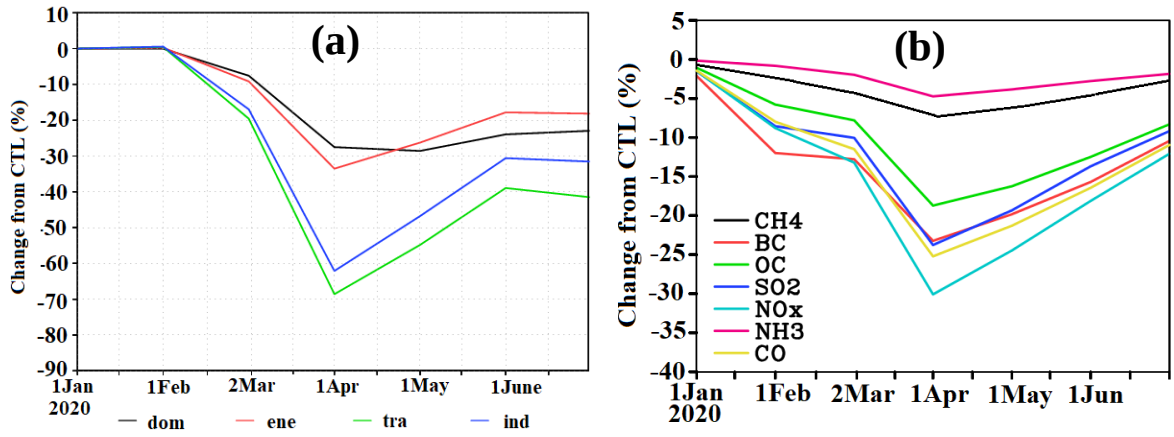

Figure S5: (a) Relative reduction of anthropogenic emissions (%) due to COVID-19 restrictions in India in the period 1 January to 1 July 2020 (COVID minus CTL). Emission sectors are color coded: residential and commercial emissions (dom, black), emissions related to energy production (ene, red), land transport related emissions (tra, green) and industrial emissions (ind, blue). The reduction is identical for all species, (b) globally averaged emission changes (%) for methane (CH_4), carbon monooxide (CO), black carbon (BC), organic carbon (OC), sulfur dioxide (SO2), ammonia (NH_3) nitrogen oxides (NOx) in the period January to 1July 2020 (COVID minus CTL).

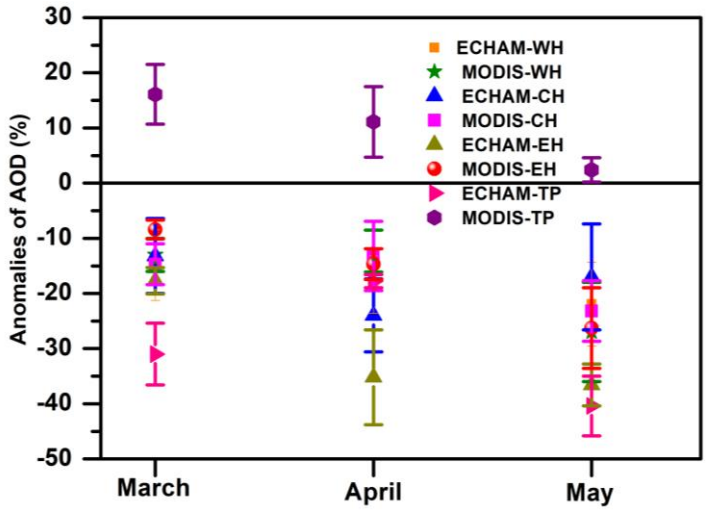

Figure S6: Anomalies (COVID minus CTL) of AOD (%) for March - May 2020 over the Western Himalayas (WH), Central Himalayas (CH), Eastern Himalayas (EH), and Tibetan Plateau (TP) regions from ECHAM-HAMMOZ (COVID minus CTL) and MODIS (year 2020 minus 2001-2019 mean).

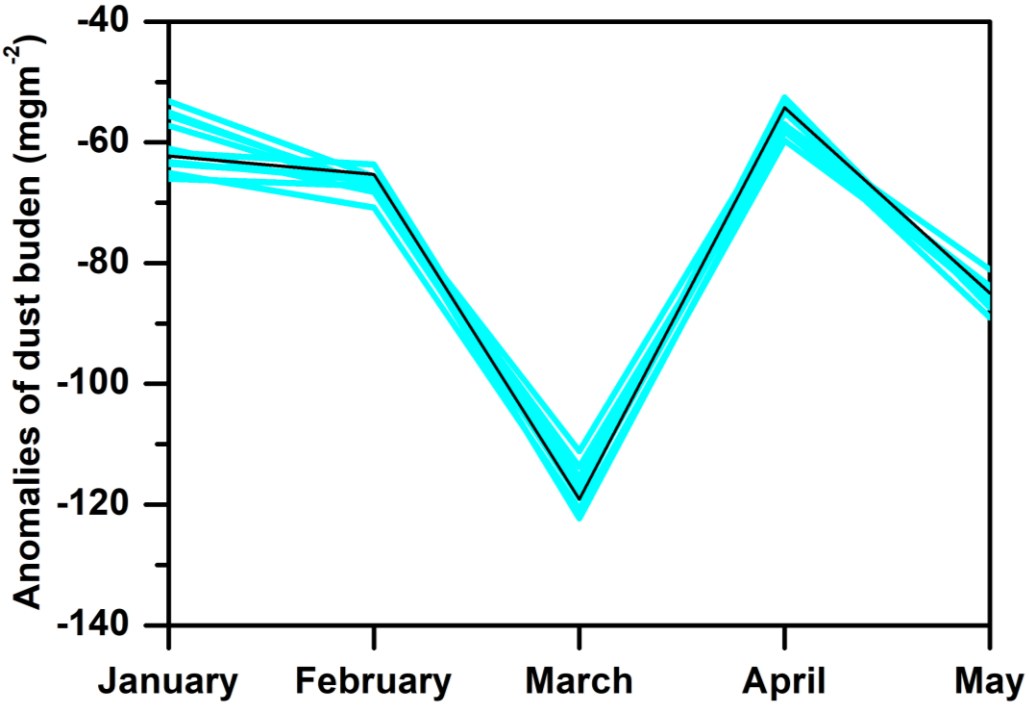

Figure S7: Anomalies of atmospheric burden of dust (mg m^{-2}) at 82° E, 33° N in the Tibetan Plateau region (COVID minus CTL) as computed with ECHAM6-HAMMOZ. The black line shows the average over the 10 members of the ECHAM6-HAMMOZ model simulation while the cyan lines indicate the results of individual members, showing the spread within the ECHAM6-HAMMOZ ensemble.