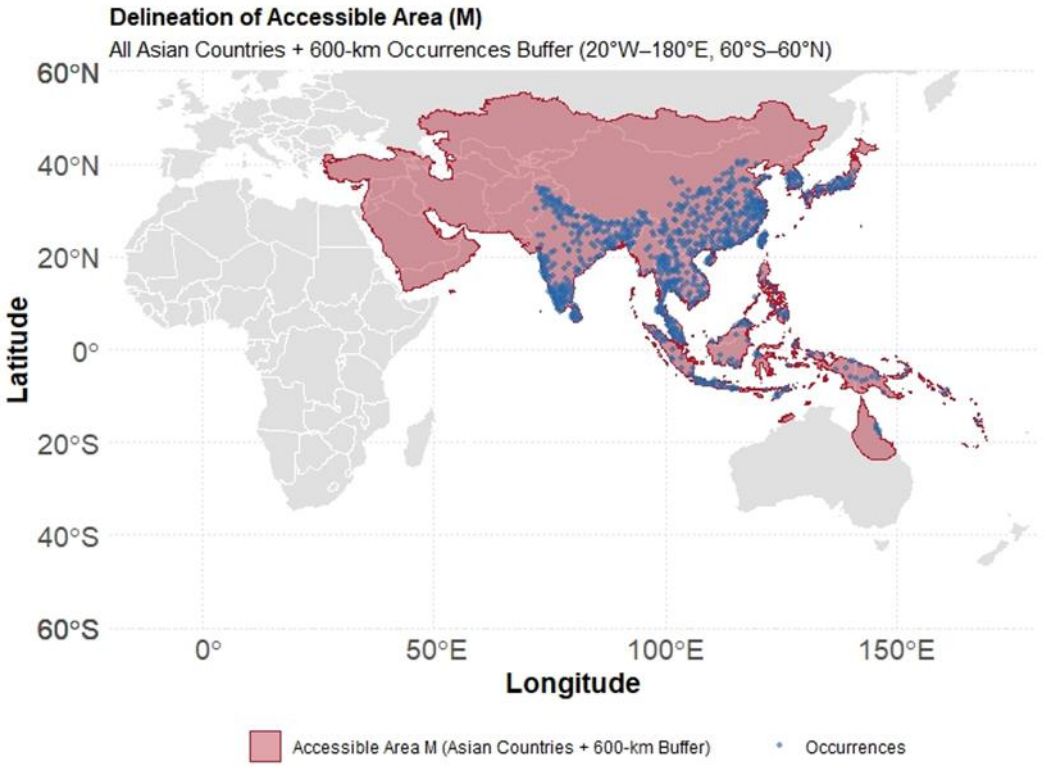
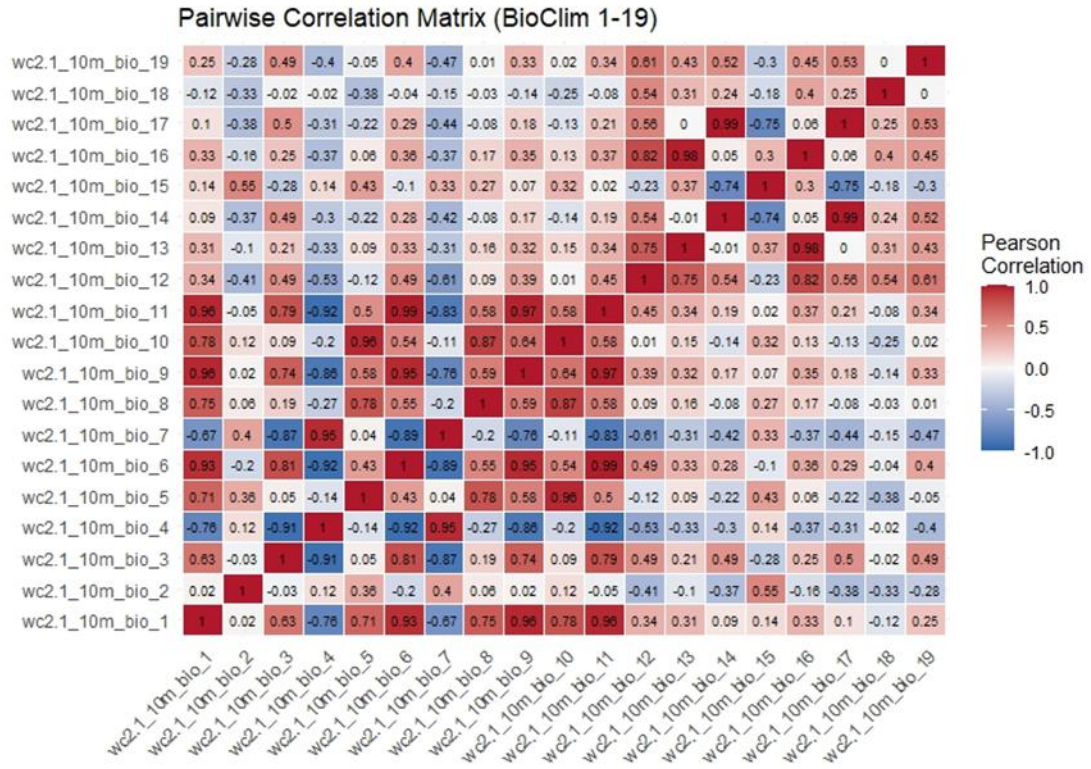
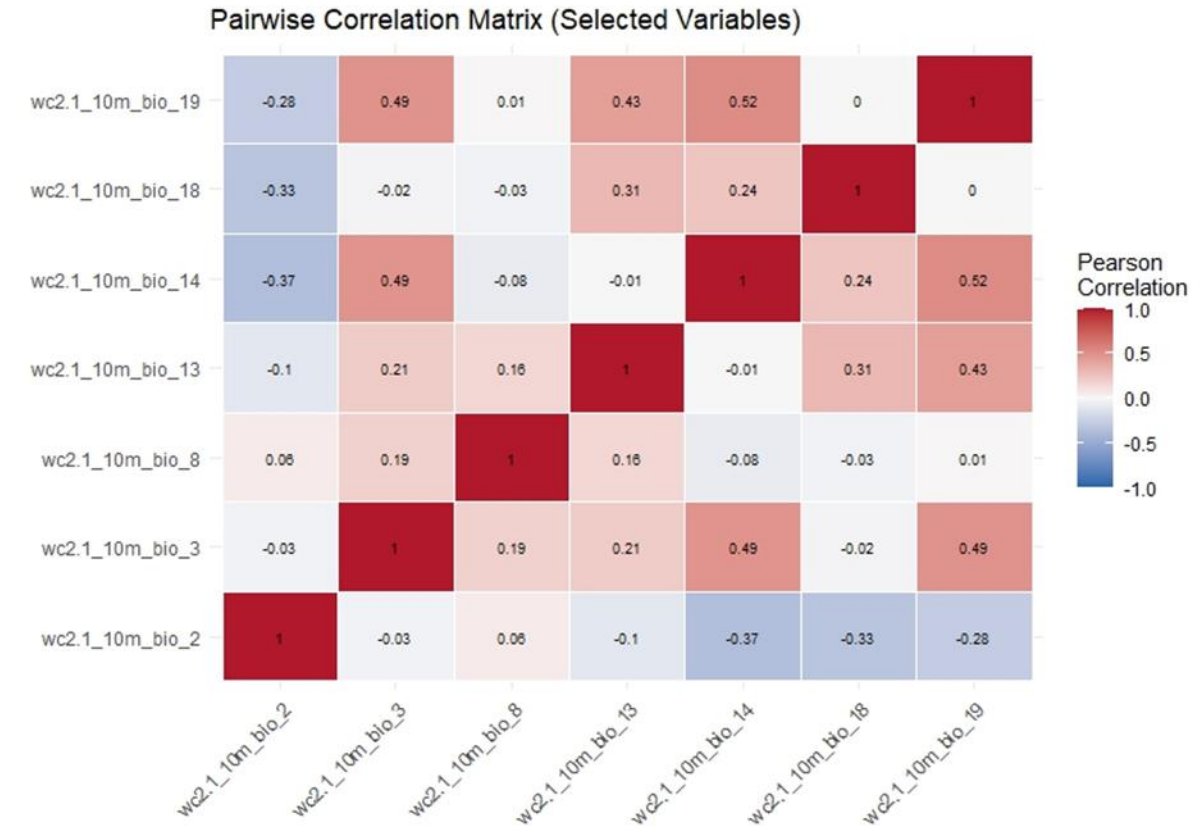


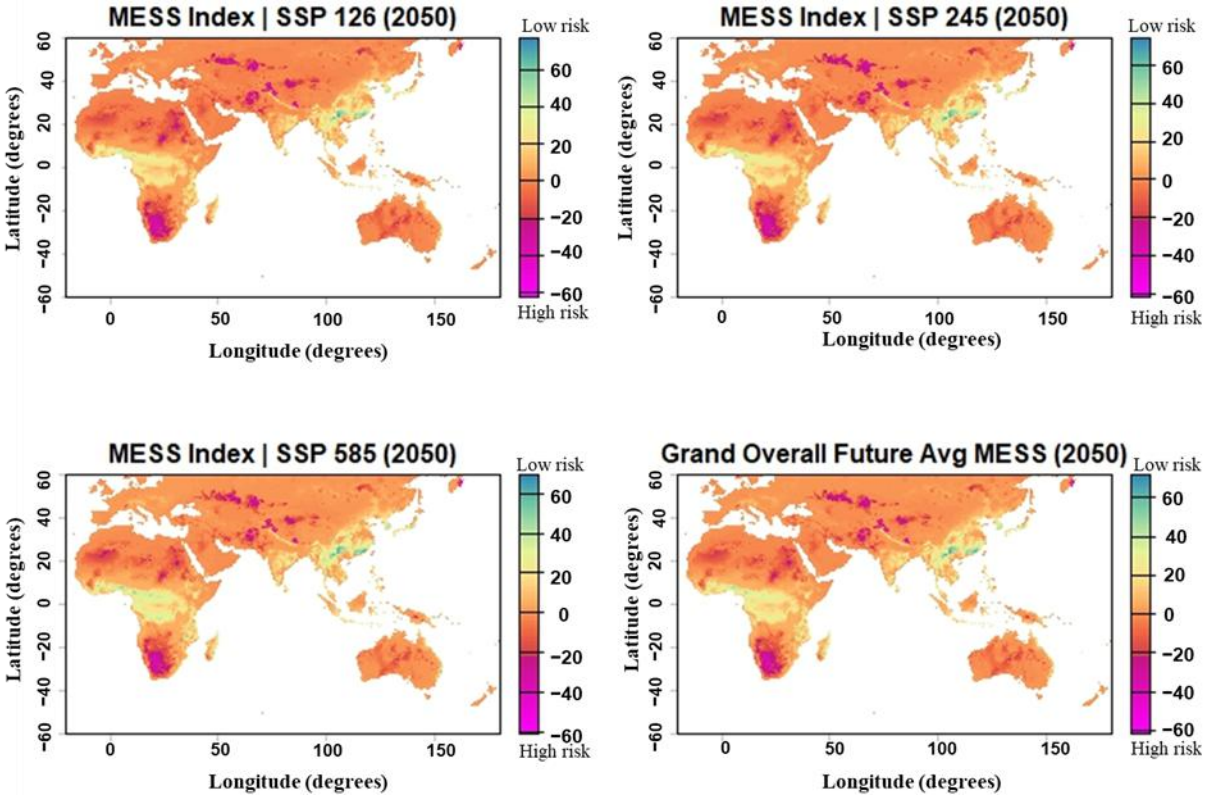
Supplementary Figure 1. Delineation of the accessible area (*M*) used for model calibration.



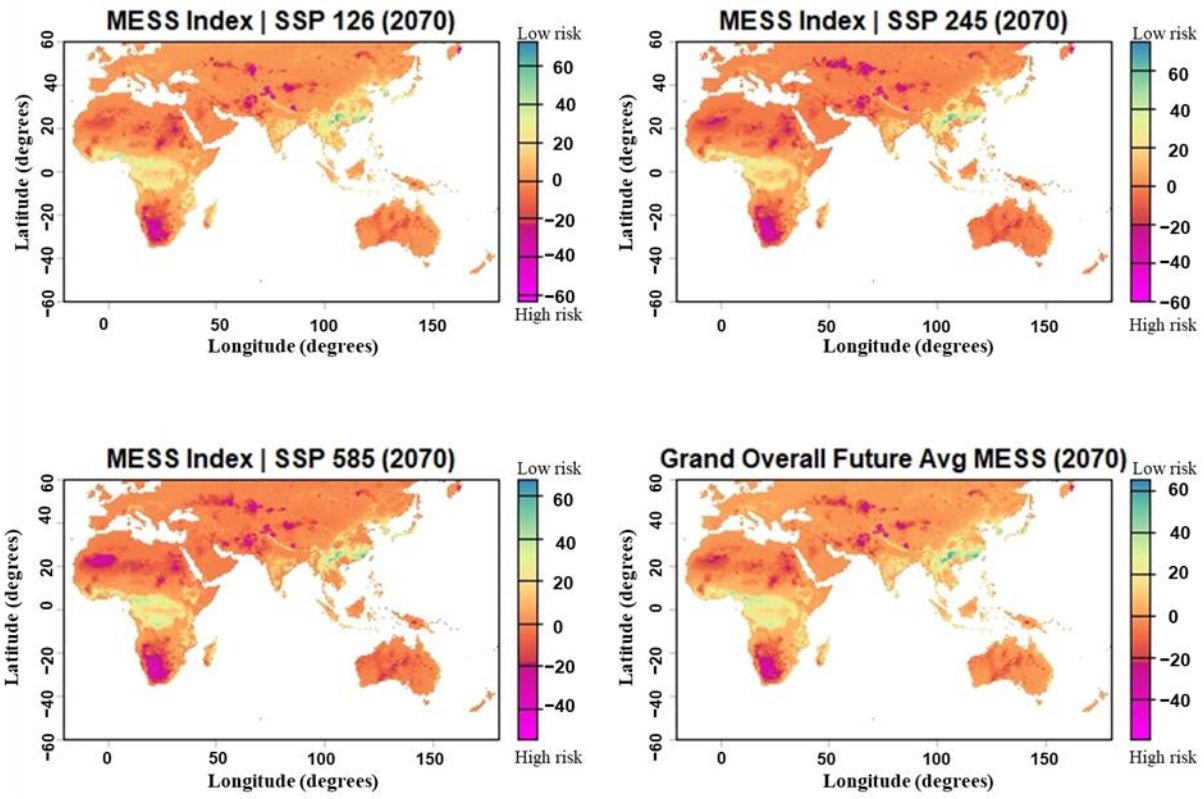
Supplementary Figure 2. Heatmap showing pairwise Pearson correlation coefficients (*r*) among the 19 WorldClim bioclimatic variables. Colors indicate the strength and direction of correlations, ranging from dark blue (r = −1.0) to dark red (r = 1.0).



Supplementary Figure 3. Heatmap displaying pairwise Pearson correlation coefficients (*r*) among the final subset of non-collinear WorldClim predictors (bio2, bio3, bio8, bio13, bio14, bio18, and bio19).



Supplementary Figure 4. Multivariate Environmental Similarity Surface (MESS) map showing extrapolation risk under future climate conditions (2050) across three global climate models (IPSL-CM6A-LR, BCC-CSM2-MR, and MPI-ESM1-2-HR), three scenarios (SSP126, SSP245, and SSP585), and their ensemble average.



Supplementary Figure 5. Multivariate Environmental Similarity Surface (MESS) map showing extrapolation risk under future climate conditions (2070) across three global climate models (IPSL-CM6A-LR, BCC-CSM2-MR, and MPI-ESM1-2-HR), three scenarios (SSP126, SSP245, and SSP585), and their ensemble average.