Supplementary table 1: List of all variables downloaded and processed initially, highly correlated variables (R>0.70) were removed from final analysis (in the final model only 24 variables were used as given in table 3)

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| **S.No.** | **Layers** | **Abbreviations** | **Source** | **Date** | **Access Year** | **Unit** |
| 1 | aspect | Aspect | SRTM | 2012 | 5/1/2019 | 90 m |
| 2 | bio1 | Annual Mean Temperature | Bioclim | 2019 | 5/1/2019 | 250 m |
| 3 | bio2 | Mean Diurnal Range | Bioclim | 2019 | 5/1/2019 | 250 m |
| 4 | bio3 | Isothermality | Bioclim | 2019 | 5/1/2019 | 250 m |
| 5 | bio4 | Temperature Seasonality | Bioclim | 2019 | 5/1/2019 | 250 m |
| 6 | bio5 | Max Temperature of Warmest Month | Bioclim | 2019 | 5/1/2019 | 250 m |
| 7 | bio6 | Min Temperature of Coldest Month | Bioclim | 2019 | 5/1/2019 | 250 m |
| 8 | bio7 | Temperature Annual Range (BIO5-BIO6) | Bioclim | 2019 | 5/1/2019 | 250 m |
| 9 | bio8 | Mean Temperature of Wettest Quarter | Bioclim | 2019 | 5/1/2019 | 250 m |
| 10 | bio9 | Mean Temperature of Driest Quarter | Bioclim | 2019 | 5/1/2019 | 250 m |
| 11 | bio10 | Mean Temperature of Warmest Quarter | Bioclim | 2019 | 5/1/2019 | 250 m |
| 12 | bio11 | Mean Temperature of Coldest Quarter | Bioclim | 2019 | 5/1/2019 | 250 m |
| 13 | bio12 | Annual Precipitation | Bioclim | 2019 | 5/1/2019 | 250 m |
| 14 | bio13 | Precipitation of Wettest Month | Bioclim | 2019 | 5/1/2019 | 250 m |
| 15 | bio14 | Precipitation of Driest Month | Bioclim | 2019 | 5/1/2019 | 250 m |
| 16 | bio15 | Precipitation Seasonality | Bioclim | 2019 | 5/1/2019 | 250 m |
| 17 | bio16 | Precipitation of Wettest Quarter | Bioclim | 2019 | 5/1/2019 | 250 m |
| 18 | bio17 | Precipitation of Driest Quarter | Bioclim | 2019 | 5/1/2019 | 250 m |
| 19 | bio18 | Precipitation of Warmest Quarter | Bioclim | 2019 | 5/1/2019 | 250 m |
| 20 | bio19 | Precipitation of Coldest Quarter | Bioclim | 2019 | 5/1/2019 | 250 m |
| 21 | dem | Digital Elevation Model | SRTM | 2012 | 5/1/2019 | 90 m |
| 22 | dist-river | Euclidean Distance of River | Sikkim Forest Department | 2018 | 5/1/2019 | 90m |
| 23 | ndvi\_01 | Normalize Difference Vegetaion Index (January) | MODIS | 2017 | 5/1/2019 | 250 m |
| 24 | ndvi\_02 | Normalize Difference Vegetaion Index (February) | MODIS | 2017 | 5/1/2019 | 250 m |
| 25 | ndvi\_03 | Normalize Difference Vegetaion Index (March) | MODIS | 2017 | 5/1/2019 | 250 m |
| 26 | ndvi\_04 | Normalize Difference Vegetaion Index (April) | MODIS | 2017 | 5/1/2019 | 250 m |
| 27 | ndvi\_05 | Normalize Difference Vegetaion Index (May) | MODIS | 2017 | 5/1/2019 | 250 m |
| 28 | ndvi\_06 | Normalize Difference Vegetaion Index (June) | MODIS | 2017 | 5/1/2019 | 250 m |
| 29 | ndvi\_07 | Normalize Difference Vegetaion Index (July) | MODIS | 2017 | 5/1/2019 | 250 m |
| 30 | ndvi\_08 | Normalize Difference Vegetaion Index (August) | MODIS | 2017 | 5/1/2019 | 250 m |
| 31 | ndvi\_09 | Normalize Difference Vegetaion Index (September) | MODIS | 2017 | 5/1/2019 | 250 m |
| 32 | ndvi\_10 | Normalize Difference Vegetaion Index (October) | MODIS | 2017 | 5/1/2019 | 250 m |
| 33 | ndvi\_11 | Normalize Difference Vegetaion Index (November) | MODIS | 2017 | 5/1/2019 | 250 m |
| 34 | ndvi\_12 | Normalize Difference Vegetaion Index (December) | MODIS | 2017 | 5/1/2019 | 250 m |
| 35 | nightlight | Nightlight Data | VIIRS NOAA Night time data | 2015 | 5/1/2019 | 500m |
| 36 | slope | Slope | SRTM | 2012 | 5/1/2019 | 90 m |
| 37 | Forest\_ed | Euclidean Distance of Forest type | Sikkim Forest Department | 2018 | 5/1/2019 | 90m |
| 38 | pa\_ed | Euclidean Distance of Protected Areas | Sikkim Forest Department | 2018 | 5/1/2019 | 90m |