**Supplementary Table:**

**S1:** Scores used for individual parameters within influencing land degradation

|  |  |  |
| --- | --- | --- |
| **Index** | **Scores** | **Reference** |
| **Soil Index (SI)** |  |  |
| D = soil depth; | 0.24 | Abuzaid et al., 2021, Xiao et al., 2020; Swamy et al. 2022 |
| GWD = ground water depth | 0.44 | Abuzaid et al., 2021 |
| SD = soil drainage | 0.1 | Abuzaid et al., 2021 |
| E = Erosivity | 0.14 | Abuzaid et al., 2021 |
| pH | 0.08 | Abuzaid et al., 2021; Pandey et al. 2022 |
| Sum | 1.00 |  |
| **Terrain Index (TI)** |  |  |
| Slope | 0.25 | FAO 2006; Abuzaid et al., 2021; Thakur et al. 2022a |
| Aspect | 0.38 | Sharam and Singh 2017; Abuzaid et al., 2021 |
| Drainage | 0.17 | Zhao et al., 2002; Abuzaid et al., 2021 |
| Curvature | 0.2 | Zhao et al., 2002; Abuzaid et al., 2021 |
| Sum | 1.00 |  |
| **Climate Index (CI)** |  |  |
| Temperature | 0.15 | Hong et al., 2013; Abuzaid et al., 2021; Thakur et al. 2021 |
| Rainfall | 0.19 | Hong et al., 2013; Abuzaid et al., 2021; Thakur et al. 2021 |
| Humidity | 0.43 | Hong et al., 2013; Abuzaid et al., 2021; Thakur et al. 2021 |
| Wind velocity | 0.23 | Abuzaid et al., 2021 |
| Sum. | 1.00 |  |
| **Land Utilization Index (LUI)** |  |  |
| Vegetation Index | 0.22 | Dasgupta et al., 2002; Abuzaid et al., 2021 |
| Land Capability Index | 0.41 | Abuzaid et al., 2021 |
| Land use land cover | 0.37 | Rahman et al., 2009; Abuzaid et al., 2021 |
| Sum | 1.00 |  |
| **Vegetation Index** |  |  |
| Mean NDVI Vegetated Area | 0.73 | Abuzaid et al., 2021; Swamy et al. 2022 |
| Mean NDVI of Bare site | 0.27 | Abuzaid et al., 2021; Swamy et al. 2022 |
| Sum | 1.00 |  |

**S2:** LULC and Change Detection distribution in Sohagpur Coal Mines, Jamuna & Kotma Coal Mines and Bishrampur Coal Mines in 1994, 2007 and 2022

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Area (ha)** | | | | **Difference**  **Area (ha)** |
| **Land Use** | **1994** | | **2007** | **2022** |
| **Sohagpur Coal Mines** | | | | |
| *Forest* | 725 | | 610 | 480 | -245 |
| *Plantation* | 342 | | 210 | 542 | 200 |
| *Agriculture* | 221 | | 284 | 182 | -39 |
| *Coal Mines* | 556 | | 895 | 736 | 180 |
| *OB Dumps* | 328 | | 514 | 472 | 144 |
| *Waste Land* | 159 | | 195 | 128 | -31 |
| *Settlements* | 258 | | 231 | 287 | 29 |
| *Water Bodies* | 755 | | 405 | 517 | -238 |
| ***Total*** | **3344** | | **3344** | **3344** |  |
|  | | **Jamuna & Kotma Coal Mines** | | | |
| *Forest* | 325 | | 198 | 121 | -204 |
| *Plantation* | 55 | | 31 | 76 | 21 |
| *Agriculture* | 154 | | 135 | 104 | -50 |
| *Coal Mines* | 205 | | 298 | 340 | 135 |
| *OB Dumps* | 55 | | 152 | 167 | 112 |
| *Waste Land* | 65 | | 74 | 48 | -17 |
| *Settlements* | 142 | | 132 | 163 | 21 |
| *Water Bodies* | 157 | | 138 | 139 | -18 |
| ***Total*** | **1158** | | **1158** | **1158** |  |
|  | | **Bishrampur Coal Mines** | | | |
| *Forest* | 845 | | 712 | 527 | -318 |
| *Plantation* | 102 | | 87 | 254 | 152 |
| *Agriculture* | 385 | | 341 | 310 | -75 |
| *Coal Mines* | 568 | | 688 | 784 | 216 |
| *OB Dumps* | 203 | | 357 | 259 | 56 |
| *Waste Land* | 86 | | 131 | 158 | 72 |
| *Settlements* | 186 | | 171 | 179 | -7 |
| *Water Bodies* | 347 | | 235 | 251 | -96 |
| ***Total*** | **2722** | | **2722** | **2722** |  |