**Ecological stoichiometry and environmental influencing factors of soil nutrients in the karst rocky desertification ecosystem, Southwest China**

**Maoyin S****heng,** **Pan Wang, Linjiao Wang,** **Kangning Xiong**

**Supplementary table S1**: Basic information of the 180 sample plots in the present study

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Serial number | No. of sample plot | Experimental site  (No.) | Latitude  (°) | Longitude  (°) | Altitude  (m) | Landform  /(Assigned value) | Slope position /(Assigned value) | Slope  (°) | Aspect  /(Assigned value) | Degree of rocky desertification  /(Assigned value) | Interference human activity /(Assigned value) |
| 1 | I-1 | Yachi(I) | 27.1501 | 105.2130 | 1,465 | Steep slope/(4) | Middle/(3) | 35 | North/(4) | Severe/(5) | Severe/(4) |
| 2 | I-2 | Yachi(I) | 27.1512 | 105.2140 | 1,465 | Steep slope/(4) | Middle/(3) | 35 | North/(4) | Severe/(5) | Severe/(4) |
| 3 | I-3 | Yachi(I) | 27.1502 | 105.2129 | 1,465 | Steep slope/(4) | Middle/(3) | 35 | North/(4) | Severe/(5) | Severe/(4) |
| 4 | I-4 | Yachi(I) | 27.1485 | 105.2120 | 1,530 | Valley slope/(5) | Lower/(4) | 22 | West/(2) | Severe/(5) | Severe/(4) |
| 5 | I-5 | Yachi(I) | 27.1469 | 105.2130 | 1,530 | Valley slope/(5) | Lower/(4) | 22 | West/(2) | Severe/(5) | Severe/(4) |
| 6 | I-6 | Yachi(I) | 27.1474 | 105.2120 | 1,530 | Valley slope/(5) | Lower/(4) | 22 | West/(2) | Severe/(5) | Severe/(4) |
| 7 | I-7 | Yachi(I) | 27.1490 | 105.2140 | 1,533 | Valley slope/(5) | Lower/(4) | 20 | North/(4) | Severe/(5) | Moderate/(3) |
| 8 | I-8 | Yachi(I) | 27.1478 | 105.2140 | 1,533 | Valley slope/(5) | Lower/(4) | 20 | North/(4) | Severe/(5) | Moderate/(3) |
| 9 | I-9 | Yachi(I) | 27.1493 | 105.2136 | 1,533 | Valley slope/(5) | Lower/(4) | 20 | North/(4) | Severe/(5) | Severe/(4) |
| 10 | I-10 | Yachi(I) | 27.1501 | 105.2140 | 1,545 | Steep slope/(4) | Middle/(3) | 29 | North/(4) | Severe/(5) | Severe/(4) |
| 11 | I-11 | Yachi(I) | 27.1501 | 105.2143 | 1,545 | Steep slope/(4) | Middle/(3) | 29 | North/(4) | Severe/(5) | Moderate/(3) |
| 12 | I-12 | Yachi(I) | 27.1510 | 105.2129 | 1,545 | Steep slope/(4) | Middle/(3) | 29 | North/(4) | Severe/(5) | Moderate/(3) |
| 13 | I-13 | Yachi(I) | 27.1501 | 105.2133 | 1,475 | Steep slope/(4) | Middle/(3) | 27 | South/(3) | Moderate/(4) | Severe/(4) |
| 14 | I-14 | Yachi(I) | 27.1500 | 105.2126 | 1,475 | Steep slope/(4) | Middle/(3) | 27 | South/(3) | Moderate/(4) | Severe/(4) |
| 15 | I-15 | Yachi(I) | 27.1513 | 105.2111 | 1,475 | Steep slope/(4) | Middle/(3) | 27 | South/(3) | Moderate/(4) | Moderate/(3) |
| 16 | I-16 | Yachi(I) | 27.1512 | 105.2145 | 1,463 | Steep slope/(4) | Middle/(3) | 25 | North/(4) | Moderate/(4) | Severe/(4) |
| 17 | I-17 | Yachi(I) | 27.1500 | 105.2142 | 1,463 | Steep slope/(4) | Middle/(3) | 25 | North/(4) | Moderate/(4) | Moderate/(3) |
| 18 | I-18 | Yachi(I) | 27.1515 | 105.2138 | 1,463 | Steep slope/(4) | Middle/(3) | 25 | North/(4) | Moderate/(4) | Severe/(4) |
| 19 | I-19 | Yachi(I) | 27.1542 | 105.2110 | 1,452 | Valley slope/(5) | Lower/(4) | 22 | East/(1) | Moderate/(4) | Severe/(4) |
| 20 | I-20 | Yachi(I) | 27.1530 | 105.2111 | 1,452 | Valley slope/(5) | Lower/(4) | 22 | East/(1) | Moderate/(4) | Moderate/(3) |
| 21 | I-21 | Yachi(I) | 27.1531 | 105.2110 | 1,452 | Valley slope/(5) | Lower/(4) | 22 | East/(1) | Moderate/(4) | Moderate/(3) |
| 22 | I-22 | Yachi(I) | 27.1498 | 105.2107 | 1,445 | Valley slope/(5) | Lower/(4) | 20 | South/(3) | Moderate/(4) | Moderate/(3) |
| 23 | I-23 | Yachi(I) | 27.1486 | 105.2103 | 1,445 | Valley slope/(5) | Lower/(4) | 20 | South/(3) | Moderate/(4) | Moderate/(3) |
| 24 | I-24 | Yachi(I) | 27.1495 | 105.2116 | 1,445 | Valley slope/(5) | Lower/(4) | 20 | South/(3) | Moderate/(4) | Moderate/(3) |
| 25 | I-25 | Yachi(I) | 27.1501 | 105.2152 | 1,420 | Valley slope/(5) | Lower/(4) | 15 | South/(3) | Slight/(3) | Moderate/(3) |
| 26 | I-26 | Yachi(I) | 27.1512 | 105.2155 | 1,420 | Valley slope/(5) | Lower/(4) | 15 | South/(3) | Slight/(3) | Moderate/(3) |
| 27 | I-27 | Yachi(I) | 27.1509 | 105.2151 | 1,420 | Valley slope/(5) | Lower/(4) | 15 | South/(3) | Slight/(3) | Moderate/(3) |
| 28 | I-28 | Yachi(I) | 27.1526 | 105.2168 | 1,430 | Steep slope/(4) | Middle/(3) | 25 | North/(4) | Slight/(3) | Moderate/(3) |
| 29 | I-29 | Yachi(I) | 27.1513 | 105.2159 | 1,430 | Steep slope/(4) | Middle/(3) | 25 | North/(4) | Slight/(3) | Severe/(4) |
| 30 | I-30 | Yachi(I) | 27.1515 | 105.2165 | 1,430 | Steep slope/(4) | Middle/(3) | 25 | North/(4) | Slight/(3) | Slight/(2) |
| **Supplementary table S1**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | Experimental site  (No.) | Latitude  (°) | Longitude  (°) | Altitude  (m) | Landform  /(Assigned value) | Slope position /(Assigned value) | Slope  (°) | Aspect  /(Assigned value) | Degree of rocky desertification  /(Assigned value) | Interference human activity /(Assigned value) |
| 31 | I-31 | Yachi(I) | 27.1529 | 105.2135 | 1,432 | Valley slope/(5) | Lower/(4) | 15 | West/(2) | Slight/(3) | Slight/(2) |
| 32 | I-32 | Yachi(I) | 27.1515 | 105.2136 | 1,432 | Valley slope/(5) | Lower/(4) | 15 | West/(2) | Slight/(3) | Slight/(2) |
| 33 | I-33 | Yachi(I) | 27.1536 | 105.2139 | 1,432 | Valley slope/(5) | Lower/(4) | 15 | West/(2) | Slight/(3) | Slight/(2) |
| 34 | I-34 | Yachi(I) | 27.1515 | 105.2122 | 1,430 | Steep slope/(4) | Middle/(3) | 20 | East/(1) | Slight/(3) | Slight/(2) |
| 35 | I-35 | Yachi(I) | 27.1521 | 105.2123 | 1,430 | Steep slope/(4) | Middle/(3) | 20 | East/(1) | Slight/(3) | Slight/(2) |
| 36 | I-36 | Yachi(I) | 27.1512 | 105.2119 | 1,430 | Steep slope/(4) | Middle/(3) | 20 | East/(1) | Slight/(3) | Slight/(2) |
| 37 | I-37 | Yachi(I) | 27.1506 | 105.2030 | 1,425 | Steep slope/(4) | Middle/(3) | 23 | North/(4) | Potential/(2) | Slight/(2) |
| 38 | I-38 | Yachi(I) | 27.1503 | 105.2031 | 1,425 | Steep slope/(4) | Middle/(3) | 23 | North/(4) | Potential/(2) | Slight/(2) |
| 39 | I-39 | Yachi(I) | 27.1515 | 105.2029 | 1,425 | Steep slope/(4) | Middle/(3) | 23 | North/(4) | Potential/(2) | Slight/(2) |
| 40 | I-40 | Yachi(I) | 27.1507 | 105.2129 | 1,420 | Valley slope/(5) | Lower/(4) | 25 | West/(2) | Potential/(2) | Nil/(1) |
| 41 | I-41 | Yachi(I) | 27.1510 | 105.2125 | 1,420 | Valley slope/(5) | Lower/(4) | 25 | West/(2) | Potential/(2) | Nil/(1) |
| 42 | I-42 | Yachi(I) | 27.1515 | 105.2118 | 1,420 | Valley slope/(5) | Lower/(4) | 25 | West/(2) | Potential/(2) | Nil/(1) |
| 43 | I-43 | Yachi(I) | 27.1508 | 105.2126 | 1,428 | Valley slope/(5) | Lower/(4) | 30 | East/(1) | Potential/(2) | Nil/(1) |
| 44 | I-44 | Yachi(I) | 27.1510 | 105.2126 | 1,428 | Valley slope/(5) | Lower/(4) | 30 | East/(1) | Potential/(2) | Nil/(1) |
| 45 | I-45 | Yachi(I) | 27.1503 | 105.2124 | 1,428 | Valley slope/(5) | Lower/(4) | 30 | East/(1) | Potential/(2) | Nil/(1) |
| 46 | I-46 | Yachi(I) | 27.1501 | 105.2141 | 1,429 | Valley slope/(5) | Lower/(4) | 40 | East/(1) | Potential/(2) | Nil/(1) |
| 47 | I-47 | Yachi(I) | 27.1500 | 105.2140 | 1,429 | Valley slope/(5) | Lower/(4) | 40 | East/(1) | Potential/(2) | Nil/(1) |
| 48 | I-48 | Yachi(I) | 27.1501 | 105.2142 | 1,429 | Valley slope/(5) | Lower/(4) | 40 | East/(1) | Potential/(2) | Nil/(1) |
| 49 | I-49 | Yachi(I) | 27.1491 | 105.2135 | 1,464 | Valley slope/(5) | Lower/(4) | 24 | North/(4) | Nil/(1) | Slight/(2) |
| 50 | I-50 | Yachi(I) | 27.1490 | 105.2134 | 1,464 | Valley slope/(5) | Lower/(4) | 24 | North/(4) | Nil/(1) | Slight/(2) |
| 51 | I-51 | Yachi(I) | 27.1488 | 105.2135 | 1,464 | Valley slope/(5) | Lower/(4) | 24 | North/(4) | Nil/(1) | Slight/(2) |
| 52 | I-52 | Yachi(I) | 27.1495 | 105.2140 | 1,428 | Valley slope/(5) | Lower/(4) | 19 | West/(2) | Nil/(1) | Nil/(1) |
| 53 | I-53 | Yachi(I) | 27.1490 | 105.2141 | 1,428 | Valley slope/(5) | Lower/(4) | 19 | West/(2) | Nil/(1) | Nil/(1) |
| 54 | I-54 | Yachi(I) | 27.1448 | 105.2141 | 1,428 | Valley slope/(5) | Lower/(4) | 19 | West/(2) | Nil/(1) | Nil/(1) |
| 55 | I-55 | Yachi(I) | 27.1515 | 105.2017 | 1,528 | Valley slope/(5) | Lower/(4) | 25 | North/(4) | Nil/(1) | Nil/(1) |
| 56 | I-56 | Yachi(I) | 27.1521 | 105.2016 | 1,528 | Valley slope/(5) | Lower/(4) | 25 | North/(4) | Nil/(1) | Nil/(1) |
| 57 | I-57 | Yachi(I) | 27.1510 | 105.2017 | 1,528 | Valley slope/(5) | Lower/(4) | 25 | North/(4) | Nil/(1) | Nil/(1) |
| 58 | I-58 | Yachi(I) | 27.1528 | 105.2016 | 1,527 | Steep slope/(4) | Middle/(3) | 21 | East/(1) | Nil/(1) | Nil/(1) |
| 59 | I-59 | Yachi(I) | 27.1530 | 105.2017 | 1,527 | Steep slope/(4) | Middle/(3) | 21 | East/(1) | Nil/(1) | Nil/(1) |
| 60 | I-60 | Yachi(I) | 27.1529 | 105.2015 | 1,527 | Steep slope/(4) | Middle/(3) | 21 | East/(1) | Nil/(1) | Nil/(1) |
| **Supplementary table S1**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | Experimental site  (No.) | Latitude  (°) | Longitude  (°) | Altitude  (m) | Landform  /(Assigned value) | Slope position /(Assigned value) | Slope  (°) | Aspect  /(Assigned value) | Degree of rocky desertification  /(Assigned value) | Interference human activity /(Assigned value) |
| 61 | II-1 | Hongfenghu(II) | 28.2807 | 108.2809 | 474 | Steep slope/(4) | Middle/(3) | 34 | North/(4) | Severe/(5) | Severe/(4) |
| 62 | II-2 | Hongfenghu(II) | 28.2802 | 108.2811 | 474 | Steep slope/(4) | Middle/(3) | 34 | North/(4) | Severe/(5) | Severe/(4) |
| 63 | II-3 | Hongfenghu(II) | 28.2810 | 108.2825 | 474 | Steep slope/(4) | Middle/(3) | 34 | North/(4) | Severe/(5) | Moderate/(3) |
| 64 | II-4 | Hongfenghu(II) | 28.2806 | 108.2810 | 463 | Steep slope/(4) | Middle/(3) | 20 | North/(4) | Severe/(5) | Severe/(4) |
| 65 | II-5 | Hongfenghu(II) | 28.2803 | 108.2839 | 463 | Steep slope/(4) | Middle/(3) | 20 | North/(4) | Severe/(5) | Severe/(4) |
| 66 | II-6 | Hongfenghu(II) | 28.2809 | 108.2854 | 463 | Steep slope/(4) | Middle/(3) | 20 | North/(4) | Severe/(5) | Severe/(4) |
| 67 | II-7 | Hongfenghu(II) | 28.2804 | 108.2807 | 474 | Steep slope/(4) | Middle/(3) | 26 | South/(3) | Severe/(5) | Severe/(4) |
| 68 | II-8 | Hongfenghu(II) | 28.2805 | 108.2828 | 474 | Steep slope/(4) | Middle/(3) | 26 | South/(3) | Severe/(5) | Moderate/(3) |
| 69 | II-9 | Hongfenghu(II) | 28.2810 | 108.2854 | 474 | Steep slope/(4) | Middle/(3) | 26 | South/(3) | Severe/(5) | Severe/(4) |
| 70 | II-10 | Hongfenghu(II) | 28.2802 | 108.2806 | 499 | Steep slope/(4) | Middle/(3) | 42 | East/(1) | Severe/(5) | Slight/(2) |
| 71 | II-11 | Hongfenghu(II) | 28.2801 | 108.2838 | 499 | Steep slope/(4) | Middle/(3) | 42 | East/(1) | Severe/(5) | Slight/(2) |
| 72 | II-12 | Hongfenghu(II) | 28.2802 | 108.2865 | 499 | Steep slope/(4) | Middle/(3) | 42 | East/(1) | Severe/(5) | Slight/(2) |
| 73 | II-13 | Hongfenghu(II) | 26.2936 | 106.1942 | 1,290 | Steep slope/(4) | Middle/(3) | 28 | South/(3) | Moderate/(4) | Severe/(4) |
| 74 | II-14 | Hongfenghu(II) | 26.2916 | 106.1931 | 1,290 | Steep slope/(4) | Middle/(3) | 28 | South/(3) | Moderate/(4) | Moderate/(3) |
| 75 | II-15 | Hongfenghu(II) | 26.2930 | 106.1929 | 1,290 | Steep slope/(4) | Middle/(3) | 28 | South/(3) | Moderate/(4) | Moderate/(3) |
| 76 | II-16 | Hongfenghu(II) | 26.3113 | 106.2059 | 1,300 | Steep slope/(4) | Middle/(3) | 36 | East/(1) | Moderate/(4) | Severe/(4) |
| 77 | II-17 | Hongfenghu(II) | 26.3111 | 106.2055 | 1,300 | Steep slope/(4) | Middle/(3) | 36 | East/(1) | Moderate/(4) | Severe/(4) |
| 78 | II-18 | Hongfenghu(II) | 26.3110 | 106.2050 | 1,300 | Steep slope/(4) | Middle/(3) | 36 | East/(1) | Moderate/(4) | Severe/(4) |
| 79 | II-19 | Hongfenghu(II) | 26.3123 | 106.2065 | 1,310 | Steep slope/(4) | Middle/(3) | 20 | West/(2) | Moderate/(4) | Moderate/(3) |
| 80 | II-20 | Hongfenghu(II) | 26.3121 | 106.2063 | 1,310 | Steep slope/(4) | Middle/(3) | 20 | West/(2) | Moderate/(4) | Moderate/(3) |
| 81 | II-21 | Hongfenghu(II) | 26.3130 | 106.2059 | 1,310 | Steep slope/(4) | Middle/(3) | 20 | West/(2) | Moderate/(4) | Moderate/(3) |
| 82 | II-22 | Hongfenghu(II) | 26.3003 | 106.1941 | 1,286 | Valley slope/(5) | Lower/(4) | 15 | West/(2) | Moderate/(4) | Slight/(2) |
| 83 | II-23 | Hongfenghu(II) | 26.3011 | 106.1939 | 1,286 | Valley slope/(5) | Lower/(4) | 15 | West/(2) | Moderate/(4) | Slight/(2) |
| 84 | II-24 | Hongfenghu(II) | 26.3001 | 106.1939 | 1,286 | Valley slope/(5) | Lower/(4) | 15 | West/(2) | Moderate/(4) | Slight/(2) |
| 85 | II-25 | Hongfenghu(II) | 26.3120 | 106.2052 | 1,316 | Carbonate platform/(1) | Top/(1) | 6 | North/(4) | Slight/(3) | Nil/(1) |
| 86 | II-26 | Hongfenghu(II) | 26.3123 | 106.2051 | 1,316 | Carbonate platform/(1) | Top/(1) | 6 | North/(4) | Slight/(3) | Nil/(1) |
| 87 | II-27 | Hongfenghu(II) | 26.3115 | 106.2050 | 1,316 | Carbonate platform/(1) | Top/(1) | 6 | North/(4) | Slight/(3) | Nil/(1) |
| 88 | II-28 | Hongfenghu(II) | 26.3113 | 106.2045 | 1,320 | Carbonate platform/(1) | Top/(1) | 10 | South/(3) | Slight/(3) | Nil/(1) |
| 89 | II-29 | Hongfenghu(II) | 26.3119 | 106.2041 | 1,320 | Carbonate platform/(1) | Top/(1) | 10 | South/(3) | Slight/(3) | Nil/(1) |
| 90 | II-30 | Hongfenghu(II) | 26.3120 | 106.2039 | 1,320 | Carbonate platform/(1) | Top/(1) | 10 | South/(3) | Slight/(3) | Nil/(1) |
| **Supplementary table S1**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | Experimental site  (No.) | Latitude  (°) | Longitude  (°) | Altitude  (m) | Landform  /(Assigned value) | Slope position /(Assigned value) | Slope  (°) | Aspect  /(Assigned value) | Degree of rocky desertification  /(Assigned value) | Interference human activity /(Assigned value) |
| 91 | II-31 | Hongfenghu(II) | 26.3023 | 106.2058 | 1,334 | Steep slope/(4) | Middle/(3) | 35 | South/(3) | Slight/(3) | Moderate/(3) |
| 92 | II-32 | Hongfenghu(II) | 26.3018 | 106.2050 | 1,334 | Steep slope/(4) | Middle/(3) | 35 | South/(3) | Slight/(3) | Severe/(4) |
| 93 | II-33 | Hongfenghu(II) | 26.3020 | 106.2049 | 1,334 | Steep slope/(4) | Middle/(3) | 35 | South/(3) | Slight/(3) | Moderate/(3) |
| 94 | II-34 | Hongfenghu(II) | 26.3096 | 106.2032 | 1,320 | Steep slope/(4) | Middle/(3) | 36 | East/(1) | Slight/(3) | Moderate/(3) |
| 95 | II-35 | Hongfenghu(II) | 26.3089 | 106.2032 | 1,320 | Steep slope/(4) | Middle/(3) | 36 | East/(1) | Slight/(3) | Moderate/(3) |
| 96 | II-36 | Hongfenghu(II) | 26.3075 | 106.2030 | 1,320 | Steep slope/(4) | Middle/(3) | 36 | East/(1) | Slight/(3) | Moderate/(3) |
| 97 | II-37 | Hongfenghu(II) | 26.2950 | 106.1948 | 1,284 | Carbonate platform/(1) | Top/(1) | 25 | South/(3) | Potential/(2) | Slight/(2) |
| 98 | II-38 | Hongfenghu(II) | 26.2955 | 106.1947 | 1,284 | Carbonate platform/(1) | Top/(1) | 25 | South/(3) | Potential/(2) | Slight/(2) |
| 99 | II-39 | Hongfenghu(II) | 26.2949 | 106.1946 | 1,284 | Carbonate platform | Top/(1) | 25 | South/(3) | Potential/(2) | Slight/(2) |
| 100 | II-40 | Hongfenghu(II) | 26.3125 | 106.2050 | 1,358 | Steep slope/(4) | Middle/(3) | 25 | North/(4) | Potential/(2) | Moderate/(3) |
| 101 | II-41 | Hongfenghu(II) | 26.3129 | 106.2049 | 1,358 | Steep slope/(4) | Middle/(3) | 25 | North/(4) | Potential/(2) | Moderate/(3) |
| 102 | II-42 | Hongfenghu(II) | 26.3120 | 106.2050 | 1,358 | Steep slope/(4) | Middle/(3) | 25 | North/(4) | Potential/(2) | Moderate/(3) |
| 103 | II-43 | Hongfenghu(II) | 26.3124 | 106.2040 | 1,325 | Valley slope/(5) | Lower/(4) | 8 | East/(1) | Potential/(2) | Nil/(1) |
| 104 | II-44 | Hongfenghu(II) | 26.3129 | 106.2044 | 1,325 | Valley slope/(5) | Lower/(4) | 8 | East/(1) | Potential/(2) | Nil/(1) |
| 105 | II-45 | Hongfenghu(II) | 26.3120 | 106.2043 | 1,325 | Valley slope/(5) | Lower/(4) | 8 | East/(1) | Potential/(2) | Nil/(1) |
| 106 | II-46 | Hongfenghu(II) | 26.3121 | 106.2077 | 1,298 | Valley slope/(5) | Lower/(4) | 20 | South/(3) | Potential/(2) | Nil/(1) |
| 107 | II-47 | Hongfenghu(II) | 26.3120 | 106.2072 | 1,298 | Valley slope/(5) | Lower/(4) | 20 | South/(3) | Potential/(2) | Nil/(1) |
| 108 | II-48 | Hongfenghu(II) | 26.3123 | 106.2069 | 1,298 | Valley slope/(5) | Lower/(4) | 20 | South/(3) | Potential/(2) | Nil/(1) |
| 109 | II-49 | Hongfenghu(II) | 26.3152 | 106.2049 | 1,358 | Steep slope/(4) | Middle/(3) | 25 | South/(3) | Nil/(1) | Slight/(2) |
| 110 | II-50 | Hongfenghu(II) | 26.3151 | 106.2047 | 1,358 | Steep slope/(4) | Middle/(3) | 25 | South/(3) | Nil/(1) | Slight/(2) |
| 111 | II-51 | Hongfenghu(II) | 26.3148 | 106.2050 | 1,358 | Steep slope/(4) | Middle/(3) | 25 | South/(3) | Nil/(1) | Slight/(2) |
| 112 | II-52 | Hongfenghu(II) | 26.3123 | 106.2039 | 1,320 | Valley slope/(5) | Lower/(4) | 8 | East/(1) | Nil/(1) | Nil/(1) |
| 113 | II-53 | Hongfenghu(II) | 26.3121 | 106.2035 | 1,320 | Valley slope/(5) | Lower/(4) | 8 | East/(1) | Nil/(1) | Nil/(1) |
| 114 | II-54 | Hongfenghu(II) | 26.3125 | 106.2030 | 1,320 | Valley slope/(5) | Lower/(4) | 8 | East/(1) | Nil/(1) | Nil/(1) |
| 115 | II-55 | Hongfenghu(II) | 26.2951 | 106.2026 | 1,277 | Valley slope/(5) | Lower/(4) | 9 | North/(4) | Nil/(1) | Nil/(1) |
| 116 | II-56 | Hongfenghu(II) | 26.2952 | 106.2028 | 1,277 | Valley slope/(5) | Lower/(4) | 9 | North/(4) | Nil/(1) | Nil/(1) |
| 117 | II-57 | Hongfenghu(II) | 26.2949 | 106.2015 | 1,277 | Valley slope/(5) | Lower/(4) | 9 | North/(4) | Nil/(1) | Nil/(1) |
| 118 | II-58 | Hongfenghu(II) | 26.2951 | 106.2002 | 1,277 | Valley slope/(5) | Lower/(4) | 9 | West/(2) | Nil/(1) | Nil/(1) |
| 119 | II-59 | Hongfenghu(II) | 26.2952 | 106.2006 | 1,277 | Valley slope/(5) | Lower/(4) | 9 | West/(2) | Nil/(1) | Nil/(1) |
| 120 | II-60 | Hongfenghu(II) | 26.2956 | 106.2012 | 1,277 | Valley slope/(5) | Lower/(4) | 9 | West/(2) | Nil/(1) | Nil/(1) |
| **Supplementary table S1**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | Experimental site  (No.) | Latitude  (°) | Longitude  (°) | Altitude  (m) | Landform  /(Assigned value) | Slope position /(Assigned value) | Slope  (°) | Aspect  /(Assigned value) | Degree of rocky desertification  /(Assigned value) | Interference human activity /(Assigned value) |
| 121 | III-1 | Huajiang(III) | 25.3979 | 105.3882 | 715 | Erosional gully/(2) | Upper/(2) | 15 | South/(3) | Severe/(5) | Slight/(2) |
| 122 | III-2 | Huajiang(III) | 25.3975 | 105.3871 | 715 | Erosional gully/(2) | Upper/(2) | 15 | South/(3) | Severe/(5) | Slight/(2) |
| 123 | III-3 | Huajiang(III) | 25.3978 | 105.3862 | 715 | Erosional gully/(2) | Upper/(2) | 15 | South/(3) | Severe/(5) | Slight/(2)) |
| 124 | III-4 | Huajiang(III) | 25.3932 | 105.3866 | 865 | Erosional gully/(2) | Upper/(2) | 30 | North/(4) | Severe/(5) | Severe/(4) |
| 125 | III-5 | Huajiang(III) | 25.3935 | 105.3870 | 865 | Erosional gully/(2) | Upper/(2) | 30 | North/(4) | Severe/(5) | Severe/(4) |
| 126 | III-6 | Huajiang(III) | 25.3936 | 105.3860 | 865 | Erosional gully/(2) | Upper/(2) | 30 | North/(4) | Severe/(5) | Severe/(4) |
| 127 | III-7 | Huajiang(III) | 25.3940 | 105.3904 | 893 | Erosional gully/(2) | Upper/(2) | 30 | North/(4) | Severe/(5) | Severe/(4) |
| 128 | III-8 | Huajiang(III) | 25.3945 | 105.3912 | 893 | Erosional gully/(2) | Upper/(2) | 30 | North/(4) | Severe/(5) | Severe/(4) |
| 129 | III-9 | Huajiang(III) | 25.3938 | 105.3900 | 893 | Erosional gully/(2) | Upper/(2) | 30 | North/(4) | Severe/(5) | Severe/(4) |
| 130 | III-10 | Huajiang(III) | 25.3945 | 105.3904 | 755 | Steep slope/(4) | Middle/(3) | 35 | South/(3) | Severe/(5) | Moderate/(3) |
| 131 | III-11 | Huajiang(III) | 25.3941 | 105.3910 | 755 | Steep slope/(4) | Middle/(3) | 35 | South/(3) | Severe/(5) | Moderate/(3) |
| 132 | III-12 | Huajiang(III) | 25.3938 | 105.3926 | 755 | Steep slope/(4) | Middle/(3) | 35 | South/(3) | Severe/(5) | Moderate/(3) |
| 133 | III-13 | Huajiang(III) | 25.3836 | 105.3897 | 820 | Erosional gully/(2) | Bottom/(5) | 25 | West/(2) | Moderate/(4) | Moderate/(3) |
| 134 | III-14 | Huajiang(III) | 25.3835 | 105.3890 | 820 | Erosional gully/(2) | Bottom/(5) | 25 | West/(2) | Moderate/(4) | Moderate/(3) |
| 135 | III-15 | Huajiang(III) | 25.3829 | 105.3889 | 820 | Erosional gully/(2) | Bottom/(5) | 25 | West/(2) | Moderate/(4) | Moderate/(3) |
| 136 | III-16 | Huajiang(III) | 25.3986 | 105.3997 | 814 | Erosional gully/(2) | Upper/(2) | 20 | South/(3) | Moderate/(4) | Severe/(4) |
| 137 | III-17 | Huajiang(III) | 25.3981 | 105.3990 | 814 | Erosional gully/(2) | Upper/(2) | 20 | South/(3) | Moderate/(4) | Severe/(4) |
| 138 | III-18 | Huajiang(III) | 25.3965 | 105.3989 | 814 | Erosional gully/(2) | Upper/(2) | 20 | South/(3) | Moderate/(4) | Severe/(4) |
| 139 | III-19 | Huajiang(III) | 25.3812 | 105.3817 | 785 | Valley slope/(5) | Lower/(4) | 20 | West/(2) | Moderate/(4) | Moderate/(3) |
| 140 | III-20 | Huajiang(III) | 25.3811 | 105.3816 | 785 | Valley slope/(5) | Lower/(4) | 20 | West/(2) | Moderate/(4) | Moderate/(3) |
| 141 | III-21 | Huajiang(III) | 25.3802 | 105.3812 | 785 | Valley slope/(5) | Lower/(4) | 20 | West/(2) | Moderate/(4) | Moderate/(3) |
| 142 | III-22 | Huajiang(III) | 25.3948 | 105.3861 | 772 | Valley slope/(5) | Lower/(4) | 20 | North/(4) | Moderate/(4) | Severe/(4) |
| 143 | III-23 | Huajiang(III) | 25.3945 | 105.3860 | 772 | Valley slope/(5) | Lower/(4) | 20 | North/(4) | Moderate/(4) | Severe/(4) |
| 144 | III-24 | Huajiang(III) | 25.3931 | 105.3859 | 772 | Valley slope/(5) | Lower/(4) | 20 | North/(4) | Moderate/(4) | Severe/(4) |
| 145 | III-25 | Huajiang(III) | 25.3972 | 105.3913 | 665 | Steep slope/(4) | Middle/(3) | 45 | South/(3) | Slight/(3) | Slight/(2) |
| 146 | III-26 | Huajiang(III) | 25.3970 | 105.3911 | 665 | Steep slope/(4) | Middle/(3) | 45 | South/(3) | Slight/(3) | Slight/(2) |
| 147 | III-27 | Huajiang(III) | 25.3968 | 105.3900 | 665 | Steep slope/(4) | Middle/(3) | 45 | South/(3) | Slight/(3) | Slight/(2) |
| 148 | III-28 | Huajiang(III) | 25.3965 | 105.3875 | 745 | Valley slope/(5) | Lower/(4) | 40 | South/(3) | Slight/(3) | Slight/(2) |
| 149 | III-29 | Huajiang(III) | 25.3960 | 105.3875 | 745 | Valley slope/(5) | Lower/(4) | 40 | South/(3) | Slight/(3) | Slight/(2) |
| 150 | III-30 | Huajiang(III) | 25.3953 | 105.3871 | 745 | Valley slope/(5) | Lower/(4) | 40 | South/(3) | Slight/(3) | Slight/(2) |
| **Supplementary table S1**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | Experimental site  (No.) | Latitude  (°) | Longitude  (°) | Altitude  (m) | Landform  /(Assigned value) | Slope position /(Assigned value) | Slope  (°) | Aspect  /(Assigned value) | Degree of rocky desertification  /(Assigned value) | Interference human activity /(Assigned value) |
| 151 | III-31 | Huajiang(III) | 25.3975 | 105.3715 | 736 | Valley slope/(5) | Lower/(4) | 30 | West/(2) | Slight/(3) | Nil/(1) |
| 152 | III-32 | Huajiang(III) | 25.3970 | 105.3712 | 736 | Valley slope/(5) | Lower/(4) | 30 | West/(2) | Slight/(3) | Nil/(1) |
| 153 | III-33 | Huajiang(III) | 25.3967 | 105.3710 | 736 | Valley slope/(5) | Lower/(4) | 30 | West/(2) | Slight/(3) | Nil/(1) |
| 154 | III-34 | Huajiang(III) | 25.3984 | 105.3892 | 721 | Carbonate platform/(1) | Upper/(2) | 0 | East/(1) | Slight/(3) | Moderate/(3) |
| 155 | III-35 | Huajiang(III) | 25.3985 | 105.3891 | 721 | Carbonate platform/(1) | Upper/(2) | 0 | East/(1) | Slight/(3) | Moderate/(3) |
| 156 | III-36 | Huajiang(III) | 25.3935 | 105.3890 | 721 | Carbonate platform/(1) | Upper/(2) | 0 | East/(1) | Slight/(3) | Moderate/(3) |
| 157 | III-37 | Huajiang(III) | 25.3934 | 105.3876 | 800 | Carbonate platform/(1) | Top/(1) | 0 | West/(2) | Potential/(2) | Slight/(2) |
| 158 | III-38 | Huajiang(III) | 25.3928 | 105.3869 | 800 | Carbonate platform/(1) | Top/(1) | 0 | West/(2) | Potential/(2) | Slight/(2) |
| 159 | III-39 | Huajiang(III) | 25.3930 | 105.3872 | 800 | Carbonate platform/(1) | Top/(1) | 0 | West/(2) | Potential/(2) | Slight/(2) |
| 160 | III-40 | Huajiang(III) | 25.3958 | 105.3870 | 735 | Karst valley/(3) | Bottom/(5) | 0 | North/(4) | Potential/(2) | Nil/(1) |
| 161 | III-41 | Huajiang(III) | 25.3951 | 105.3874 | 735 | Karst valley/(3) | Bottom/(5) | 0 | North/(4) | Potential/(2) | Nil/(1) |
| 162 | III-42 | Huajiang(III) | 25.3947 | 105.3869 | 735 | Karst valley/(3) | Bottom/(5) | 0 | North/(4) | Potential/(2) | Nil/(1) |
| 163 | III-43 | Huajiang(III) | 25.3967 | 105.3870 | 725 | Karst valley/(3) | Bottom/(5) | 0 | North/(4) | Potential/(2) | Slight/(2) |
| 164 | III-44 | Huajiang(III) | 25.3960 | 105.3870 | 725 | Karst valley/(3) | Bottom/(5) | 0 | North/(4) | Potential/(2) | Slight/(2) |
| 165 | III-45 | Huajiang(III) | 25.3958 | 105.3865 | 725 | Karst valley/(3) | Bottom/(5) | 0 | North/(4) | Potential/(2) | Slight/(2) |
| 166 | III-46 | Huajiang(III) | 25.3983 | 105.3890 | 700 | Carbonate platform/(1) | Top/(1) | 0 | South/(3) | Potential/(2) | Slight/(2) |
| 167 | III-47 | Huajiang(III) | 25.3935 | 105.3889 | 700 | Carbonate platform/(1) | Top/(1) | 0 | South/(3) | Potential/(2) | Slight/(2) |
| 168 | III-48 | Huajiang(III) | 25.3974 | 105.3888 | 700 | Carbonate platform/(1) | Top/(1) | 0 | South/(3) | Potential/(2) | Slight/(2) |
| 169 | III-49 | Huajiang(III) | 25.3941 | 105.3859 | 802 | Carbonate platform/(1) | Top/(1) | 0 | West/(2) | Nil/(1) | Slight/(2) |
| 170 | III-50 | Huajiang(III) | 25.3940 | 105.3842 | 802 | Carbonate platform/(1) | Top/(1) | 0 | West/(2) | Nil/(1) | Slight/(2) |
| 171 | III-51 | Huajiang(III) | 25.3929 | 105.3840 | 802 | Carbonate platform/(1) | Top/(1) | 0 | West/(2) | Nil/(1) | Slight/(2) |
| 172 | III-52 | Huajiang(III) | 25.3948 | 105.3839 | 724 | Karst valley/(3) | Bottom/(5) | 5 | North/(4) | Nil/(1) | Severe/(4) |
| 173 | III-53 | Huajiang(III) | 25.3941 | 105.3835 | 724 | Karst valley/(3) | Bottom/(5) | 5 | North/(4) | Nil/(1) | Severe/(4) |
| 174 | III-54 | Huajiang(III) | 25.3942 | 105.3832 | 724 | Karst valley/(3) | Bottom/(5) | 5 | North/(4) | Nil/(1) | Severe/(4) |
| 175 | III-55 | Huajiang(III) | 25.3948 | 105.3845 | 726 | Karst valley/(3) | Bottom/(5) | 5 | West/(2) | Nil/(1) | Severe/(4) |
| 176 | III-56 | Huajiang(III) | 25.3932 | 105.3844 | 726 | Karst valley/(3) | Bottom/(5) | 5 | West/(2) | Nil/(1) | Severe/(4) |
| 177 | III-57 | Huajiang(III) | 25.3939 | 105.3843 | 726 | Karst valley/(3) | Bottom/(5) | 5 | West/(2) | Nil/(1) | Severe/(4) |
| 178 | III-58 | Huajiang(III) | 25.3947 | 105.3853 | 810 | Carbonate platform/(1) | Top/(1) | 25 | North/(4) | Nil/(1) | Slight/(2) |
| 179 | III-59 | Huajiang(III) | 25.3948 | 105.3848 | 810 | Carbonate platform/(1) | Top/(1) | 25 | North/(4) | Nil/(1) | Slight/(2) |
| 180 | III-60 | Huajiang(III) | 25.3946 | 105.3851 | 810 | Carbonate platform/(1) | Top/(1) | 25 | North/(4) | Nil/(1) | Slight/(2) |

**Supplementary table S2:**Contents and stoichiometric ratios of soil nutrient C, N, P, and K of the 180 sample plots in the three Experimental sites

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Serial number | No. of sample plot | C  (g·kg-1) | N  (g·kg-1) | P  (g·kg-1) | K  (g·kg-1) | C:N | C:P | C:K | N:P | N:K | P:K |
| 1 | I-1 | 10.1600 | 0.7200 | 0.2100 | 0.7300 | 14.1111 | 48.3810 | 13.9178 | 3.4286 | 0.9863 | 0.2877 |
| 2 | I-2 | 50.2000 | 2.4000 | 0.4100 | 1.4100 | 20.9167 | 122.4390 | 35.6028 | 5.8537 | 1.7021 | 0.2908 |
| 3 | I-3 | 56.2300 | 1.0200 | 0.6000 | 1.8900 | 55.1357 | 93.7307 | 29.7558 | 1.7000 | 0.5397 | 0.3175 |
| 4 | I-4 | 46.5461 | 2.1500 | 0.3000 | 0.8000 | 21.6493 | 155.1535 | 58.1826 | 7.1667 | 2.6875 | 0.3750 |
| 5 | I-5 | 69.4200 | 2.3500 | 0.5300 | 1.3500 | 29.5404 | 130.9811 | 51.4222 | 4.4340 | 1.7407 | 0.3926 |
| 6 | I-6 | 70.2100 | 2.2000 | 0.8000 | 2.0200 | 31.9136 | 87.7625 | 34.7574 | 2.7500 | 1.0891 | 0.3960 |
| 7 | I-7 | 50.2800 | 3.4000 | 0.4000 | 1.2000 | 14.7882 | 125.7000 | 41.9000 | 8.5000 | 2.8333 | 0.3333 |
| 8 | I-8 | 68.2231 | 3.0200 | 0.4500 | 1.5000 | 22.5904 | 151.6069 | 45.4821 | 6.7111 | 2.0133 | 0.3000 |
| 9 | I-9 | 74.7100 | 3.3000 | 0.7800 | 1.7800 | 22.6394 | 95.7821 | 41.9719 | 4.2308 | 1.8539 | 0.4382 |
| 10 | I-10 | 67.8000 | 3.5000 | 0.7200 | 1.4300 | 19.3714 | 94.1667 | 47.4126 | 4.8611 | 2.4476 | 0.5035 |
| 11 | I-11 | 67.1200 | 3.2000 | 0.7800 | 1.6000 | 20.9750 | 86.0513 | 41.9500 | 4.1026 | 2.0000 | 0.4875 |
| 12 | I-12 | 52.9000 | 3.1700 | 0.8900 | 2.1300 | 16.6877 | 59.4382 | 24.8357 | 3.5618 | 1.4883 | 0.4178 |
| 13 | I-13 | 32.6000 | 1.7000 | 0.3600 | 0.7600 | 19.1765 | 90.5556 | 42.8947 | 4.7222 | 2.2368 | 0.4737 |
| 14 | I-14 | 33.7200 | 1.8100 | 0.4700 | 1.0700 | 18.6298 | 71.7447 | 31.5140 | 3.8511 | 1.6916 | 0.4393 |
| 15 | I-15 | 29.2300 | 1.3000 | 0.7200 | 1.4600 | 22.4846 | 40.5972 | 20.0205 | 1.8056 | 0.8904 | 0.4932 |
| 16 | I-16 | 46.6758 | 1.8000 | 0.4000 | 0.8000 | 25.9310 | 116.6894 | 58.3447 | 4.5000 | 2.2500 | 0.5000 |
| 17 | I-17 | 43.9700 | 1.8200 | 0.5000 | 0.9000 | 24.1593 | 87.9400 | 48.8556 | 3.6400 | 2.0222 | 0.5556 |
| 18 | I-18 | 45.2100 | 1.8500 | 0.6000 | 1.3600 | 24.4378 | 75.3500 | 33.2426 | 3.0833 | 1.3603 | 0.4412 |
| 19 | I-19 | 40.4794 | 1.6500 | 0.4400 | 1.2000 | 24.5330 | 91.9987 | 33.7329 | 3.7500 | 1.3750 | 0.3667 |
| 20 | I-20 | 49.4000 | 1.2500 | 0.4300 | 2.3400 | 39.5200 | 114.8837 | 21.1111 | 2.9070 | 0.5342 | 0.1838 |
| 21 | I-21 | 50.2100 | 1.2100 | 0.5000 | 2.8900 | 41.4959 | 100.4200 | 17.3737 | 2.4200 | 0.4187 | 0.1730 |
| 22 | I-22 | 37.6000 | 1.7000 | 0.5300 | 1.5300 | 22.1176 | 70.9434 | 24.5752 | 3.2075 | 1.1111 | 0.3464 |
| 23 | I-23 | 36.0600 | 1.3500 | 0.5000 | 2.5000 | 26.7111 | 72.1200 | 14.4240 | 2.7000 | 0.5400 | 0.2000 |
| 24 | I-24 | 35.8100 | 1.2200 | 0.6100 | 3.0600 | 29.3525 | 58.7049 | 11.7026 | 2.0000 | 0.3987 | 0.1993 |
| 25 | I-25 | 26.5300 | 1.8000 | 0.3300 | 1.0200 | 14.7389 | 80.3939 | 26.0098 | 5.4545 | 1.7647 | 0.3235 |
| 26 | I-26 | 22.3200 | 1.7200 | 0.4500 | 1.4500 | 12.9767 | 49.6000 | 15.3931 | 3.8222 | 1.1862 | 0.3103 |
| 27 | I-27 | 20.3600 | 1.6500 | 0.8500 | 3.0500 | 12.3394 | 23.9529 | 6.6754 | 1.9412 | 0.5410 | 0.2787 |
| 28 | I-28 | 19.3500 | 1.5000 | 0.2800 | 1.0100 | 12.9000 | 69.1071 | 19.1584 | 5.3571 | 1.4851 | 0.2772 |
| 29 | I-29 | 20.1500 | 1.5500 | 0.4000 | 1.4300 | 13.0000 | 50.3750 | 14.0909 | 3.8750 | 1.0839 | 0.2797 |
| 30 | I-30 | 21.3600 | 1.6200 | 0.8000 | 3.0300 | 13.1852 | 26.7000 | 7.0495 | 2.0250 | 0.5347 | 0.2640 |
| **Supplementary table S2**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | C  (g·kg-1) | N  (g·kg-1) | P  (g·kg-1) | K  (g·kg-1) | C:N | C:P | C:K | N:P | N:K | P:K |
| 31 | I-31 | 24.1330 | 1.8100 | 0.3000 | 1.0000 | 13.3332 | 80.4434 | 24.1330 | 6.0333 | 1.8100 | 0.3000 |
| 32 | I-32 | 19.8100 | 1.7100 | 0.4200 | 1.4000 | 11.5848 | 47.1667 | 14.1500 | 4.0714 | 1.2214 | 0.3000 |
| 33 | I-33 | 25.6300 | 1.8600 | 0.8200 | 3.0100 | 13.7796 | 31.2561 | 8.5150 | 2.2683 | 0.6179 | 0.2724 |
| 34 | I-34 | 18.3000 | 1.3000 | 0.2700 | 0.9800 | 14.0769 | 67.7778 | 18.6735 | 4.8148 | 1.3265 | 0.2755 |
| 35 | I-35 | 23.5000 | 1.4000 | 0.3800 | 1.3800 | 16.7857 | 61.8421 | 17.0290 | 3.6842 | 1.0145 | 0.2754 |
| 36 | I-36 | 19.2600 | 1.3300 | 0.8300 | 2.9500 | 14.4812 | 23.2048 | 6.5288 | 1.6024 | 0.4508 | 0.2814 |
| 37 | I-37 | 18.3000 | 1.1000 | 0.4600 | 0.9700 | 16.6364 | 39.7826 | 18.8660 | 2.3913 | 1.1340 | 0.4742 |
| 38 | I-38 | 18.2600 | 1.1300 | 0.4600 | 1.4600 | 16.1593 | 39.6957 | 12.5068 | 2.4565 | 0.7740 | 0.3151 |
| 39 | I-39 | 12.0600 | 1.0500 | 0.6500 | 2.2600 | 11.4857 | 18.5538 | 5.3363 | 1.6154 | 0.4646 | 0.2876 |
| 40 | I-40 | 21.2600 | 1.7000 | 0.4500 | 0.9600 | 12.5059 | 47.2444 | 22.1458 | 3.7778 | 1.7708 | 0.4688 |
| 41 | I-41 | 31.8200 | 1.8500 | 0.4500 | 1.4000 | 17.2000 | 70.7111 | 22.7286 | 4.1111 | 1.3214 | 0.3214 |
| 42 | I-42 | 30.2300 | 1.8900 | 0.5600 | 2.2200 | 15.9947 | 53.9821 | 13.6171 | 3.3750 | 0.8514 | 0.2523 |
| 43 | I-43 | 25.4000 | 1.8000 | 0.8200 | 1.8200 | 14.1111 | 30.9756 | 13.9560 | 2.1951 | 0.9890 | 0.4505 |
| 44 | I-44 | 24.4200 | 1.7400 | 0.8000 | 2.8000 | 14.0345 | 30.5250 | 8.7214 | 2.1750 | 0.6214 | 0.2857 |
| 45 | I-45 | 18.8400 | 1.3500 | 0.8700 | 4.9100 | 13.9556 | 21.6552 | 3.8371 | 1.5517 | 0.2749 | 0.1772 |
| 46 | I-46 | 12.3600 | 1.1000 | 0.8000 | 3.0500 | 11.2364 | 15.4500 | 4.0525 | 1.3750 | 0.3607 | 0.2623 |
| 47 | I-47 | 18.3600 | 1.1200 | 0.8100 | 4.0500 | 16.3929 | 22.6667 | 4.5333 | 1.3827 | 0.2765 | 0.2000 |
| 48 | I-48 | 11.3200 | 1.1500 | 0.7800 | 6.7700 | 9.8435 | 14.5128 | 1.6721 | 1.4744 | 0.1699 | 0.1152 |
| 49 | I-49 | 23.2000 | 1.6000 | 1.0200 | 1.0200 | 14.5000 | 22.7451 | 22.7451 | 1.5686 | 1.5686 | 1.0000 |
| 50 | I-50 | 23.4000 | 1.3500 | 0.9900 | 1.9900 | 17.3333 | 23.6364 | 11.7588 | 1.3636 | 0.6784 | 0.4975 |
| 51 | I-51 | 25.6800 | 1.8700 | 1.0100 | 2.9700 | 13.7326 | 25.4257 | 8.6465 | 1.8515 | 0.6296 | 0.3401 |
| 52 | I-52 | 54.7000 | 2.8000 | 0.6200 | 2.6200 | 19.5357 | 88.2258 | 20.8779 | 4.5161 | 1.0687 | 0.2366 |
| 53 | I-53 | 48.6100 | 2.3600 | 0.5600 | 5.5600 | 20.5975 | 86.8036 | 8.7428 | 4.2143 | 0.4245 | 0.1007 |
| 54 | I-54 | 47.5400 | 2.0400 | 1.0700 | 9.9100 | 23.3039 | 44.4299 | 4.7972 | 1.9065 | 0.2059 | 0.1080 |
| 55 | I-55 | 40.4794 | 2.6000 | 0.6100 | 2.6100 | 15.5690 | 66.3597 | 15.5094 | 4.2623 | 0.9962 | 0.2337 |
| 56 | I-56 | 54.0697 | 2.6500 | 0.5500 | 4.6500 | 20.4037 | 98.3086 | 11.6279 | 4.8182 | 0.5699 | 0.1183 |
| 57 | I-57 | 35.6400 | 2.5000 | 1.0800 | 9.0100 | 14.2560 | 33.0000 | 3.9556 | 2.3148 | 0.2775 | 0.1199 |
| 58 | I-58 | 106.5000 | 4.6200 | 0.7600 | 2.7600 | 23.0519 | 140.1316 | 38.5870 | 6.0789 | 1.6739 | 0.2754 |
| 59 | I-59 | 106.2800 | 4.5800 | 0.6600 | 4.6600 | 23.2052 | 161.0303 | 22.8069 | 6.9394 | 0.9828 | 0.1416 |
| 60 | I-60 | 98.6600 | 4.4300 | 0.7800 | 5.0900 | 22.2709 | 126.4872 | 19.3831 | 5.6795 | 0.8703 | 0.1532 |
| **Supplementary table S2**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | C  (g·kg-1) | N  (g·kg-1) | P  (g·kg-1) | K  (g·kg-1) | C:N | C:P | C:K | N:P | N:K | P:K |
| 61 | II-1 | 16.9000 | 1.3900 | 0.5500 | 14.0000 | 12.1583 | 30.7273 | 1.2071 | 2.5273 | 0.0993 | 0.0393 |
| 62 | II-2 | 18.7000 | 1.2600 | 0.3300 | 10.9000 | 14.8413 | 56.6667 | 1.7156 | 3.8182 | 0.1156 | 0.0303 |
| 63 | II-3 | 28.5200 | 2.8700 | 0.9100 | 14.4700 | 9.9373 | 31.3407 | 1.9710 | 3.1538 | 0.1983 | 0.0629 |
| 64 | II-4 | 28.7000 | 1.7100 | 0.6700 | 17.3000 | 16.7836 | 42.8358 | 1.6590 | 2.5522 | 0.0988 | 0.0387 |
| 65 | II-5 | 28.6000 | 1.7300 | 0.5600 | 12.4000 | 16.5318 | 51.0714 | 2.3065 | 3.0893 | 0.1395 | 0.0452 |
| 66 | II-6 | 34.2400 | 10.0400 | 0.8600 | 22.0700 | 3.4104 | 39.8140 | 1.5514 | 11.6744 | 0.4549 | 0.0390 |
| 67 | II-7 | 18.6000 | 1.3900 | 0.4900 | 11.8000 | 13.3813 | 37.9592 | 1.5763 | 2.8367 | 0.1178 | 0.0415 |
| 68 | II-8 | 20.3000 | 1.3100 | 0.4400 | 12.6000 | 15.4962 | 46.1364 | 1.6111 | 2.9773 | 0.1040 | 0.0349 |
| 69 | II-9 | 26.8900 | 1.8800 | 0.8400 | 15.2400 | 14.3032 | 32.0119 | 1.7644 | 2.2381 | 0.1234 | 0.0551 |
| 70 | II-10 | 35.8000 | 1.9900 | 0.3300 | 7.2600 | 17.9900 | 108.4848 | 4.9311 | 6.0303 | 0.2741 | 0.0455 |
| 71 | II-11 | 35.8200 | 1.7300 | 0.2800 | 8.4100 | 20.7052 | 127.9286 | 4.2592 | 6.1786 | 0.2057 | 0.0333 |
| 72 | II-12 | 27.2300 | 2.1500 | 1.2800 | 12.1600 | 12.6651 | 21.2734 | 2.2393 | 1.6797 | 0.1768 | 0.1053 |
| 73 | II-13 | 54.0596 | 1.5600 | 0.6700 | 5.3400 | 34.6536 | 80.6859 | 10.1235 | 2.3284 | 0.2921 | 0.1255 |
| 74 | II-14 | 77.8900 | 1.6800 | 0.7000 | 6.7800 | 46.3631 | 111.2714 | 11.4882 | 2.4000 | 0.2478 | 0.1032 |
| 75 | II-15 | 42.1300 | 1.4300 | 0.7800 | 6.7700 | 29.4615 | 54.0128 | 6.2230 | 1.8333 | 0.2112 | 0.1152 |
| 76 | II-16 | 64.3600 | 3.8400 | 1.3500 | 1.3500 | 16.7604 | 47.6741 | 47.6741 | 2.8444 | 2.8444 | 1.0000 |
| 77 | II-17 | 69.7100 | 3.9700 | 1.1600 | 2.1600 | 17.5592 | 60.0948 | 32.2731 | 3.4224 | 1.8380 | 0.5370 |
| 78 | II-18 | 62.9000 | 3.4300 | 1.1500 | 3.6000 | 18.3382 | 54.6957 | 17.4722 | 2.9826 | 0.9528 | 0.3194 |
| 79 | II-19 | 64.0475 | 3.6600 | 1.3000 | 1.5000 | 17.4993 | 49.2673 | 42.6983 | 2.8154 | 2.4400 | 0.8667 |
| 80 | II-20 | 72.2131 | 3.8400 | 1.1200 | 1.8000 | 18.8055 | 64.4760 | 40.1184 | 3.4286 | 2.1333 | 0.6222 |
| 81 | II-21 | 66.9600 | 3.1200 | 1.1800 | 3.3000 | 21.4615 | 56.7458 | 20.2909 | 2.6441 | 0.9455 | 0.3576 |
| 82 | II-22 | 68.6000 | 3.0500 | 0.5600 | 0.9600 | 22.4918 | 122.5000 | 71.4583 | 5.4464 | 3.1771 | 0.5833 |
| 83 | II-23 | 58.6000 | 2.6000 | 0.5000 | 1.5000 | 22.5385 | 117.2000 | 39.0667 | 5.2000 | 1.7333 | 0.3333 |
| 84 | II-24 | 53.4900 | 2.5700 | 0.8600 | 1.8400 | 20.8132 | 62.1977 | 29.0707 | 2.9884 | 1.3967 | 0.4674 |
| 85 | II-25 | 36.8500 | 1.4600 | 0.6600 | 1.6600 | 25.2397 | 55.8333 | 22.1988 | 2.2121 | 0.8795 | 0.3976 |
| 86 | II-26 | 35.7900 | 1.3200 | 0.5600 | 2.5600 | 27.1136 | 63.9107 | 13.9805 | 2.3571 | 0.5156 | 0.2188 |
| 87 | II-27 | 30.6400 | 1.4300 | 0.6800 | 3.7500 | 21.4266 | 45.0588 | 8.1707 | 2.1029 | 0.3813 | 0.1813 |
| 88 | II-28 | 66.3900 | 1.2600 | 0.7600 | 1.5600 | 52.6905 | 87.3553 | 42.5577 | 1.6579 | 0.8077 | 0.4872 |
| 89 | II-29 | 77.3500 | 1.1200 | 0.6600 | 2.4600 | 69.0625 | 117.1970 | 31.4431 | 1.6970 | 0.4553 | 0.2683 |
| 90 | II-30 | 96.3500 | 1.3500 | 0.7800 | 3.6500 | 71.3704 | 123.5256 | 26.3973 | 1.7308 | 0.3699 | 0.2137 |
| **Supplementary table S2**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | C  (g·kg-1) | N  (g·kg-1) | P  (g·kg-1) | K  (g·kg-1) | C:N | C:P | C:K | N:P | N:K | P:K |
| 91 | II-31 | 68.9600 | 3.2600 | 1.1000 | 1.3000 | 21.1534 | 62.6909 | 53.0462 | 2.9636 | 2.5077 | 0.8462 |
| 92 | II-32 | 70.6300 | 4.6800 | 1.0000 | 1.8000 | 15.0919 | 70.6300 | 39.2389 | 4.6800 | 2.6000 | 0.5556 |
| 93 | II-33 | 98.5000 | 4.5500 | 1.4300 | 2.7000 | 21.6502 | 68.8871 | 36.4847 | 3.1818 | 1.6852 | 0.5296 |
| 94 | II-34 | 94.1700 | 5.1800 | 1.2000 | 1.2000 | 18.1795 | 78.4750 | 78.4750 | 4.3167 | 4.3167 | 1.0000 |
| 95 | II-35 | 94.9300 | 5.2600 | 1.0100 | 1.7100 | 18.0475 | 93.9901 | 55.5146 | 5.2079 | 3.0760 | 0.5906 |
| 96 | II-36 | 83.1700 | 4.7500 | 1.5300 | 2.6600 | 17.5095 | 54.3595 | 31.2669 | 3.1046 | 1.7857 | 0.5752 |
| 97 | II-37 | 29.2400 | 1.8800 | 0.5300 | 1.5300 | 15.5532 | 55.1698 | 19.1111 | 3.5472 | 1.2288 | 0.3464 |
| 98 | II-38 | 31.1400 | 2.0600 | 0.5200 | 2.5200 | 15.1165 | 59.8846 | 12.3571 | 3.9615 | 0.8175 | 0.2063 |
| 99 | II-39 | 27.7300 | 1.4300 | 0.7100 | 4.4500 | 19.3916 | 39.0563 | 6.2315 | 2.0141 | 0.3213 | 0.1596 |
| 100 | II-40 | 38.1000 | 1.3900 | 0.2400 | 1.2400 | 27.4101 | 158.7500 | 30.7258 | 5.7917 | 1.1210 | 0.1935 |
| 101 | II-41 | 38.4200 | 1.3600 | 0.2000 | 2.2000 | 28.2500 | 192.1000 | 17.4636 | 6.8000 | 0.6182 | 0.0909 |
| 102 | II-42 | 30.1600 | 1.2200 | 0.3200 | 3.6900 | 24.7213 | 94.2500 | 8.1734 | 3.8125 | 0.3306 | 0.0867 |
| 103 | II-43 | 51.1500 | 2.5500 | 0.8300 | 1.8300 | 20.0588 | 61.6265 | 27.9508 | 3.0723 | 1.3934 | 0.4536 |
| 104 | II-44 | 50.9300 | 2.4100 | 0.7400 | 2.7400 | 21.1328 | 68.8243 | 18.5876 | 3.2568 | 0.8796 | 0.2701 |
| 105 | II-45 | 54.1200 | 2.2200 | 0.8100 | 3.7800 | 24.3784 | 66.8148 | 14.3175 | 2.7407 | 0.5873 | 0.2143 |
| 106 | II-46 | 30.6300 | 1.5500 | 0.3400 | 1.3400 | 19.7613 | 90.0882 | 22.8582 | 4.5588 | 1.1567 | 0.2537 |
| 107 | II-47 | 42.6000 | 2.1300 | 0.5600 | 2.5600 | 20.0000 | 76.0714 | 16.6406 | 3.8036 | 0.8320 | 0.2188 |
| 108 | II-48 | 46.6100 | 2.0100 | 0.8000 | 3.4200 | 23.1891 | 58.2625 | 13.6287 | 2.5125 | 0.5877 | 0.2339 |
| 109 | II-49 | 40.9800 | 1.6800 | 0.5300 | 1.5000 | 24.3929 | 77.3208 | 27.3200 | 3.1698 | 1.1200 | 0.3533 |
| 110 | II-50 | 43.1300 | 1.8900 | 0.6200 | 1.7200 | 22.8201 | 69.5645 | 25.0756 | 3.0484 | 1.0988 | 0.3605 |
| 111 | II-51 | 51.3900 | 1.9300 | 0.8700 | 1.9900 | 26.6269 | 59.0690 | 25.8241 | 2.2184 | 0.9698 | 0.4372 |
| 112 | II-52 | 51.9100 | 2.5200 | 0.7000 | 1.7000 | 20.5992 | 74.1571 | 30.5353 | 3.6000 | 1.4824 | 0.4118 |
| 113 | II-53 | 53.1600 | 2.6900 | 0.8300 | 1.8300 | 19.7621 | 64.0482 | 29.0492 | 3.2410 | 1.4699 | 0.4536 |
| 114 | II-54 | 41.0300 | 1.4300 | 0.7500 | 2.1000 | 28.6923 | 54.7067 | 19.5381 | 1.9067 | 0.6810 | 0.3571 |
| 115 | II-55 | 28.9200 | 1.4200 | 0.4500 | 5.4500 | 20.3662 | 64.2667 | 5.3064 | 3.1556 | 0.2606 | 0.0826 |
| 116 | II-56 | 43.5200 | 1.5300 | 0.4900 | 8.4900 | 28.4444 | 88.8163 | 5.1260 | 3.1224 | 0.1802 | 0.0577 |
| 117 | II-57 | 52.4000 | 1.7200 | 0.6500 | 11.1000 | 30.4651 | 80.6154 | 4.7207 | 2.6462 | 0.1550 | 0.0586 |
| 118 | II-58 | 43.9400 | 1.7800 | 0.5000 | 2.5300 | 24.6854 | 87.8800 | 17.3676 | 3.5600 | 0.7036 | 0.1976 |
| 119 | II-59 | 45.8300 | 1.8900 | 0.4800 | 3.4800 | 24.2487 | 95.4792 | 13.1695 | 3.9375 | 0.5431 | 0.1379 |
| 120 | II-60 | 39.0300 | 1.7300 | 0.6000 | 6.8700 | 22.5607 | 65.0500 | 5.6812 | 2.8833 | 0.2518 | 0.0873 |
| **Supplementary table S2**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | C  (g·kg-1) | N  (g·kg-1) | P  (g·kg-1) | K  (g·kg-1) | C:N | C:P | C:K | N:P | N:K | P:K |
| 121 | III-1 | 39.5000 | 2.6000 | 0.7400 | 1.7400 | 15.1923 | 53.3784 | 22.7011 | 3.5135 | 1.4943 | 0.4253 |
| 122 | III-2 | 42.7400 | 2.7700 | 0.7800 | 2.1800 | 15.4296 | 54.7949 | 19.6055 | 3.5513 | 1.2706 | 0.3578 |
| 123 | III-3 | 35.9600 | 1.4300 | 1.0800 | 2.8900 | 25.1469 | 33.2963 | 12.4429 | 1.3241 | 0.4948 | 0.3737 |
| 124 | III-4 | 30.3000 | 2.2000 | 0.7300 | 1.2300 | 13.7727 | 41.5068 | 24.6341 | 3.0137 | 1.7886 | 0.5935 |
| 125 | III-5 | 30.3400 | 1.7200 | 0.8700 | 1.4700 | 17.6395 | 34.8736 | 20.6395 | 1.9770 | 1.1701 | 0.5918 |
| 126 | III-6 | 35.0500 | 2.8700 | 1.2000 | 1.6000 | 12.2125 | 29.2083 | 21.9063 | 2.3917 | 1.7938 | 0.7500 |
| 127 | III-7 | 56.3000 | 3.1000 | 0.9600 | 1.2600 | 18.1613 | 58.6458 | 44.6825 | 3.2292 | 2.4603 | 0.7619 |
| 128 | III-8 | 59.9800 | 3.8100 | 0.9100 | 1.7100 | 15.7428 | 65.9121 | 35.0760 | 4.1868 | 2.2281 | 0.5322 |
| 129 | III-9 | 48.7300 | 3.4300 | 1.4500 | 1.9600 | 14.2070 | 33.6069 | 24.8622 | 2.3655 | 1.7500 | 0.7398 |
| 130 | III-10 | 46.2000 | 2.0700 | 0.2800 | 9.9900 | 22.3188 | 165.0000 | 4.6246 | 7.3929 | 0.2072 | 0.0280 |
| 131 | III-11 | 48.2400 | 2.4900 | 0.3000 | 12.1000 | 19.3735 | 160.8000 | 3.9868 | 8.3000 | 0.2058 | 0.0248 |
| 132 | III-12 | 52.4300 | 2.9000 | 0.5900 | 14.8000 | 18.0793 | 88.8644 | 3.5426 | 4.9153 | 0.1959 | 0.0399 |
| 133 | III-13 | 41.2000 | 3.0600 | 0.8700 | 0.8700 | 13.4641 | 47.3563 | 47.3563 | 3.5172 | 3.5172 | 1.0000 |
| 134 | III-14 | 45.2300 | 3.3900 | 0.7900 | 1.0900 | 13.3422 | 57.2532 | 41.4954 | 4.2911 | 3.1101 | 0.7248 |
| 135 | III-15 | 49.8500 | 3.1900 | 1.2000 | 1.1800 | 15.6270 | 41.5417 | 42.2458 | 2.6583 | 2.7034 | 1.0169 |
| 136 | III-16 | 51.8581 | 2.3600 | 0.8500 | 0.8600 | 21.9738 | 61.0095 | 60.3001 | 2.7765 | 2.7442 | 0.9884 |
| 137 | III-17 | 45.6300 | 2.3500 | 0.7600 | 1.0800 | 19.4170 | 60.0395 | 42.2500 | 3.0921 | 2.1759 | 0.7037 |
| 138 | III-18 | 53.6500 | 3.0300 | 1.1000 | 1.1600 | 17.7063 | 48.7727 | 46.2500 | 2.7545 | 2.6121 | 0.9483 |
| 139 | III-19 | 39.7378 | 2.6300 | 0.8400 | 0.8500 | 15.1094 | 47.3069 | 46.7503 | 3.1310 | 3.0941 | 0.9882 |
| 140 | III-20 | 55.6300 | 2.5600 | 0.7500 | 1.0700 | 21.7305 | 74.1733 | 51.9907 | 3.4133 | 2.3925 | 0.7009 |
| 141 | III-21 | 58.6900 | 2.7000 | 1.0800 | 1.1500 | 21.7370 | 54.3426 | 51.0348 | 2.5000 | 2.3478 | 0.9391 |
| 142 | III-22 | 35.6000 | 2.5400 | 0.9700 | 1.9700 | 14.0157 | 36.7010 | 18.0711 | 2.6186 | 1.2893 | 0.4924 |
| 143 | III-23 | 34.4300 | 2.8200 | 0.8300 | 1.8300 | 12.2092 | 41.4819 | 18.8142 | 3.3976 | 1.5410 | 0.4536 |
| 144 | III-24 | 29.3700 | 2.4300 | 0.9700 | 2.2100 | 12.0864 | 30.2784 | 13.2896 | 2.5052 | 1.0995 | 0.4389 |
| 145 | III-25 | 52.3000 | 3.6800 | 1.3800 | 1.3800 | 14.2120 | 37.8986 | 37.8986 | 2.6667 | 2.6667 | 1.0000 |
| 146 | III-26 | 62.5000 | 3.7900 | 1.1900 | 1.1900 | 16.4908 | 52.5210 | 52.5210 | 3.1849 | 3.1849 | 1.0000 |
| 147 | III-27 | 53.4000 | 3.8300 | 1.0100 | 2.6300 | 13.9426 | 52.8713 | 20.3042 | 3.7921 | 1.4563 | 0.3840 |
| 148 | III-28 | 31.4000 | 2.4000 | 0.8700 | 1.3700 | 13.0833 | 36.0920 | 22.9197 | 2.7586 | 1.7518 | 0.6350 |
| 149 | III-29 | 37.8800 | 2.5400 | 0.8400 | 1.8400 | 14.9134 | 45.0952 | 20.5870 | 3.0238 | 1.3804 | 0.4565 |
| 150 | III-30 | 30.4400 | 2.3500 | 1.1400 | 2.8500 | 12.9532 | 26.7018 | 10.6807 | 2.0614 | 0.8246 | 0.4000 |
| **Supplementary table S2**(continued) | | | | | | | | | | | |
| Serial number | No. of sample plot | C  (g·kg-1) | N  (g·kg-1) | P  (g·kg-1) | K  (g·kg-1) | C:N | C:P | C:K | N:P | N:K | P:K |
| 151 | III-31 | 33.9348 | 2.3000 | 0.8500 | 1.3600 | 14.7543 | 39.9233 | 24.9520 | 2.7059 | 1.6912 | 0.6250 |
| 152 | III-32 | 47.2500 | 2.4400 | 0.8000 | 1.8300 | 19.3648 | 59.0625 | 25.8197 | 3.0500 | 1.3333 | 0.4372 |
| 153 | III-33 | 38.6300 | 2.2500 | 1.1300 | 2.8000 | 17.1689 | 34.1858 | 13.7964 | 1.9912 | 0.8036 | 0.4036 |
| 154 | III-34 | 37.6000 | 2.9000 | 0.8000 | 1.8000 | 12.9655 | 47.0000 | 20.8889 | 3.6250 | 1.6111 | 0.4444 |
| 155 | III-35 | 44.5900 | 3.3800 | 0.6800 | 2.6800 | 13.1923 | 65.5735 | 16.6381 | 4.9706 | 1.2612 | 0.2537 |
| 156 | III-36 | 40.3900 | 3.5900 | 1.1300 | 3.5700 | 11.2507 | 35.7434 | 11.3137 | 3.1770 | 1.0056 | 0.3165 |
| 157 | III-37 | 28.8000 | 2.6000 | 1.4600 | 1.4600 | 11.0769 | 19.7260 | 19.7260 | 1.7808 | 1.7808 | 1.0000 |
| 158 | III-38 | 30.9200 | 2.7600 | 1.5300 | 2.5300 | 11.2029 | 20.2092 | 12.2213 | 1.8039 | 1.0909 | 0.6047 |
| 159 | III-39 | 29.0600 | 2.8700 | 1.1500 | 3.2200 | 10.1254 | 25.2696 | 9.0248 | 2.4957 | 0.8913 | 0.3571 |
| 160 | III-40 | 29.7000 | 2.7900 | 1.2900 | 1.2900 | 10.6452 | 23.0233 | 23.0233 | 2.1628 | 2.1628 | 1.0000 |
| 161 | III-41 | 34.2400 | 2.9600 | 1.2000 | 2.2000 | 11.5676 | 28.5333 | 15.5636 | 2.4667 | 1.3455 | 0.5455 |
| 162 | III-42 | 35.7300 | 3.1900 | 1.2200 | 3.0800 | 11.2006 | 29.2869 | 11.6006 | 2.6148 | 1.0357 | 0.3961 |
| 163 | III-43 | 31.0579 | 2.5600 | 1.2000 | 1.2000 | 12.1320 | 25.8816 | 25.8816 | 2.1333 | 2.1333 | 1.0000 |
| 164 | III-44 | 38.0470 | 2.8300 | 1.1800 | 2.0100 | 13.4442 | 32.2432 | 18.9289 | 2.3983 | 1.4080 | 0.5871 |
| 165 | III-45 | 36.1748 | 3.0900 | 1.2000 | 3.0600 | 11.7071 | 30.1457 | 11.8218 | 2.5750 | 1.0098 | 0.3922 |
| 166 | III-46 | 35.8000 | 2.7000 | 0.9400 | 1.9400 | 13.2593 | 38.0851 | 18.4536 | 2.8723 | 1.3918 | 0.4845 |
| 167 | III-47 | 38.3500 | 2.8300 | 0.9900 | 2.9900 | 13.5512 | 38.7374 | 12.8261 | 2.8586 | 0.9465 | 0.3311 |
| 168 | III-48 | 34.6900 | 2.4300 | 0.5600 | 3.6700 | 14.2757 | 61.9464 | 9.4523 | 4.3393 | 0.6621 | 0.1526 |
| 169 | III-49 | 65.3600 | 2.6300 | 0.9300 | 1.9000 | 24.8517 | 70.2796 | 34.4000 | 2.8280 | 1.3842 | 0.4895 |
| 170 | III-50 | 70.2500 | 2.7500 | 0.9600 | 1.9200 | 25.5455 | 73.1771 | 36.5885 | 2.8646 | 1.4323 | 0.5000 |
| 171 | III-51 | 77.6900 | 2.3500 | 0.9000 | 3.0500 | 33.0596 | 86.3222 | 25.4721 | 2.6111 | 0.7705 | 0.2951 |
| 172 | III-52 | 69.6500 | 2.8900 | 1.0200 | 1.9100 | 24.1003 | 68.2843 | 36.4660 | 2.8333 | 1.5131 | 0.5300 |
| 173 | III-53 | 80.2300 | 2.6300 | 0.9600 | 1.9500 | 30.5057 | 83.5729 | 41.1436 | 2.7396 | 1.3487 | 0.4900 |
| 174 | III-54 | 89.3600 | 2.5500 | 0.9000 | 3.0800 | 35.0431 | 99.2889 | 29.0130 | 2.8333 | 0.8279 | 0.2900 |
| 175 | III-55 | 75.2300 | 7.3600 | 1.5500 | 3.6000 | 10.2215 | 48.5355 | 20.8972 | 4.7484 | 2.0444 | 0.4306 |
| 176 | III-56 | 75.2700 | 7.5600 | 1.5400 | 3.8000 | 9.9563 | 48.8766 | 19.8079 | 4.9091 | 1.9895 | 0.4053 |
| 177 | III-57 | 96.5400 | 7.9600 | 1.6000 | 4.3500 | 12.1287 | 60.3403 | 22.1941 | 4.9750 | 1.8299 | 0.3678 |
| 178 | III-58 | 84.1000 | 7.5000 | 1.1600 | 1.1600 | 11.2133 | 72.5000 | 72.5000 | 6.4655 | 6.4655 | 1.0000 |
| 179 | III-59 | 94.1600 | 7.5700 | 0.9600 | 0.9600 | 12.4386 | 98.0833 | 98.0833 | 7.8854 | 7.8854 | 1.0000 |
| 180 | III-60 | 83.5900 | 7.3000 | 1.2000 | 1.3800 | 11.4507 | 69.6583 | 60.5725 | 6.0833 | 5.2899 | 0.8696 |

**Supplementary table S3:** Values and assigned values of environmental factors of the 180 sample plots in the three Experimental sites

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Serial number | No. of sample plot | Average annual temperature  (℃) | Average annual precipitation  (mm) | Dryness  (%) | Humidity  (%) | Relative humidity  (%) | Light intensity  (lux) | Soil temperature-5cm  (℃) | Soil temperature-10cm  (℃) | Soil temperature-15cm  (℃) | Percentage of exposed rock  (%) | Vegetation cover rate  (%) | Land cover  /( Assigned value) |
| 1 | I-1 | 15.67 | 688.52 | 25.00 | 20.30 | 81.67 | 44,767.00 | 22.90 | 21.80 | 20.60 | 88 | 5 | Rock land/(6) |
| 2 | I-2 | 15.67 | 688.52 | 25.00 | 20.30 | 81.67 | 44,767.00 | 22.90 | 21.80 | 20.60 | 87 | 5 | Rock land/(6) |
| 3 | I-3 | 15.67 | 688.52 | 25.00 | 20.30 | 81.67 | 44,767.00 | 22.90 | 21.80 | 20.60 | 86 | 5 | Rock land/(6) |
| 4 | I-4 | 15.67 | 688.52 | 25.10 | 20.40 | 82.50 | 40,833.00 | 22.80 | 21.60 | 20.50 | 70 | 40 | Open woodland/(2) |
| 5 | I-5 | 15.67 | 688.52 | 25.10 | 20.40 | 82.50 | 40,833.00 | 22.80 | 21.60 | 20.50 | 71 | 35 | Open woodland/(2) |
| 6 | I-6 | 15.67 | 688.52 | 25.10 | 20.40 | 82.50 | 40,833.00 | 22.80 | 21.60 | 20.50 | 70 | 35 | Open woodland/(2) |
| 7 | I-7 | 15.67 | 688.52 | 23.20 | 18.80 | 83.72 | 33,633.00 | 23.20 | 22.10 | 20.60 | 70 | 30 | Open woodland/(2) |
| 8 | I-8 | 15.67 | 688.52 | 23.20 | 18.80 | 83.72 | 33,633.00 | 23.20 | 22.10 | 20.60 | 71 | 30 | Open woodland/(2) |
| 9 | I-9 | 15.67 | 688.52 | 23.20 | 18.80 | 83.72 | 33,633.00 | 23.20 | 22.10 | 20.60 | 72 | 30 | Open woodland/(2) |
| 10 | I-10 | 15.67 | 688.52 | － | － | － | － | 23.30 | 22.70 | 21.10 | 73 | 0 | Slope farmland/(5) |
| 11 | I-11 | 15.67 | 688.52 | － | － | － | － | 23.30 | 22.70 | 21.10 | 71 | 0 | Slope farmland/(5) |
| 12 | I-12 | 15.67 | 688.52 | － | － | － | － | 23.30 | 22.70 | 21.10 | 73 | 0 | Slope farmland/(5) |
| 13 | I-13 | 15.67 | 688.52 | 17.90 | 15.50 | 86.95 | 13,920.00 | 23.50 | 22.10 | 20.50 | 51 | 30 | Open woodland/(2) |
| 14 | I-14 | 15.67 | 688.52 | 17.90 | 15.50 | 86.95 | 13,920.00 | 23.50 | 22.10 | 20.50 | 50 | 30 | Open woodland/(2) |
| 15 | I-15 | 15.67 | 688.52 | 17.90 | 15.50 | 86.95 | 13,920.00 | 23.50 | 22.10 | 20.50 | 50 | 30 | Open woodland/(2) |
| 16 | I-16 | 15.67 | 688.52 | 17.30 | 15.80 | 91.65 | 9,387.00 | 23.70 | 22.60 | 21.50 | 51 | 20 | Open woodland/(2) |
| 17 | I-17 | 15.67 | 688.52 | 17.30 | 15.80 | 91.65 | 9,387.00 | 23.70 | 22.60 | 21.50 | 51 | 20 | Open woodland/(2) |
| 18 | I-18 | 15.67 | 688.52 | 17.30 | 15.80 | 91.65 | 9,387.00 | 23.70 | 22.60 | 21.50 | 51 | 20 | Open woodland/(2) |
| 19 | I-19 | 15.67 | 688.52 | 17.20 | 15.60 | 91.55 | 9,965.00 | 23.50 | 22.70 | 21.20 | 55 | 20 | Open woodland/(2) |
| 20 | I-20 | 15.67 | 688.52 | 17.20 | 15.60 | 91.55 | 9,965.00 | 23.50 | 22.70 | 21.20 | 55 | 20 | Open woodland/(2) |
| 21 | I-21 | 15.67 | 688.52 | 17.20 | 15.60 | 91.55 | 9,965.00 | 23.50 | 22.70 | 21.20 | 53 | 20 | Open woodland/(2) |
| 22 | I-22 | 15.67 | 688.52 | 18.20 | 16.60 | 91.50 | 15,420.00 | 23.40 | 22.80 | 21.10 | 52 | 10 | Open woodland/(2) |
| 23 | I-23 | 15.67 | 688.52 | 18.20 | 16.60 | 91.50 | 15,420.00 | 23.40 | 22.80 | 21.10 | 55 | 10 | Open woodland/(2) |
| 24 | I-24 | 15.67 | 688.52 | 18.20 | 16.60 | 91.50 | 15,420.00 | 23.40 | 22.80 | 21.10 | 53 | 10 | Open woodland/(2) |
| 25 | I-25 | 15.67 | 688.52 | 18.40 | 16.80 | 91.57 | 16,437.00 | 23.50 | 22.80 | 20.50 | 31 | 35 | Open woodland/(2) |
| 26 | I-26 | 15.67 | 688.52 | 18.40 | 16.80 | 91.57 | 16,437.00 | 23.50 | 22.80 | 20.50 | 32 | 35 | Open woodland/(2) |
| 27 | I-27 | 15.67 | 688.52 | 18.40 | 16.80 | 91.57 | 16,437.00 | 23.50 | 22.80 | 20.50 | 31 | 35 | Open woodland/(2) |
| 28 | I-28 | 15.67 | 688.52 | 18.30 | 16.60 | 91.65 | 15,692.00 | － | － | － | 31 | 40 | Slope farmland/(5) |
| 29 | I-29 | 15.67 | 688.52 | 18.30 | 16.60 | 91.65 | 15,692.00 | － | － | － | 31 | 40 | Slope farmland/(5) |
| 30 | I-30 | 15.67 | 688.52 | 18.30 | 16.60 | 91.65 | 15,692.00 | － | － | － | 32 | 40 | Slope farmland/(5) |
| **Supplementary table S3**(continued) | | | | | | | | | | | | | |
| Serial number | No. of sample plot | Average annual temperature  (℃) | Average annual precipitation  (mm) | Dryness  (%) | Humidity  (%) | Relative humidity  (%) | Light intensity  (lux) | Soil temperature-5cm  (℃) | Soil temperature-10cm  (℃) | Soil temperature-15cm  (℃) | Percentage of exposed rock  (%) | Vegetation cover rate  (%) | Land cover  /( Assigned value) |
| 31 | I-31 | 15.67 | 688.52 | 17.40 | 15.60 | 87.64 | 18,562.00 | 23.12 | 22.30 | 20.30 | 30 | 35 | Slope farmland/(5) |
| 32 | I-32 | 15.67 | 688.52 | 17.40 | 15.60 | 87.64 | 18,562.00 | 23.12 | 22.30 | 20.30 | 30 | 35 | Slope farmland/(5) |
| 33 | I-33 | 15.67 | 688.52 | 17.40 | 15.60 | 87.64 | 18,562.00 | 23.12 | 22.30 | 20.30 | 30 | 35 | Slope farmland/(5) |
| 34 | I-34 | 15.67 | 688.52 | 17.60 | 15.40 | 87.32 | 20,367.00 | 23.10 | 22.20 | 20.10 | 30 | 0 | Slope farmland/(5) |
| 35 | I-35 | 15.67 | 688.52 | 17.60 | 15.40 | 87.32 | 20,367.00 | 23.10 | 22.20 | 20.10 | 30 | 0 | Slope farmland/(5) |
| 36 | I-36 | 15.67 | 688.52 | 17.60 | 15.40 | 87.32 | 20,367.00 | 23.10 | 22.20 | 20.10 | 30 | 0 | Slope farmland/(5) |
| 37 | I-37 | 15.67 | 688.52 | 17.90 | 16.20 | 90.74 | 24,537.00 | 22.70 | 21.50 | 19.70 | 20 | 30 | Slope farmland/(5) |
| 38 | I-38 | 15.67 | 688.52 | 17.90 | 16.20 | 90.74 | 24,537.00 | 22.70 | 21.50 | 19.70 | 20 | 30 | Slope farmland/(5) |
| 39 | I-39 | 15.67 | 688.52 | 17.90 | 16.20 | 90.74 | 24,537.00 | 22.70 | 21.50 | 19.70 | 20 | 30 | Slope farmland/(5) |
| 40 | I-40 | 15.67 | 688.52 | 17.60 | 14.80 | 85.64 | 12,050.00 | 24.00 | 23.20 | 21.50 | 21 | 35 | Slope farmland/(5) |
| 41 | I-41 | 15.67 | 688.52 | 17.60 | 14.80 | 85.64 | 12,050.00 | 24.00 | 23.20 | 21.50 | 21 | 35 | Slope farmland/(5) |
| 42 | I-42 | 15.67 | 688.52 | 17.60 | 14.80 | 85.64 | 12,050.00 | 24.00 | 23.20 | 21.50 | 22 | 35 | Slope farmland/(5) |
| 43 | I-43 | 15.67 | 688.52 | 17.80 | 15.60 | 87.26 | 18,960.00 | 23.20 | 22.20 | 21.30 | 20 | 30 | Shrub grassland/(3) |
| 44 | I-44 | 15.67 | 688.52 | 17.80 | 15.60 | 87.26 | 18,960.00 | 23.20 | 22.20 | 21.30 | 20 | 30 | Shrub grassland/(3) |
| 45 | I-45 | 15.67 | 688.52 | 17.80 | 15.60 | 87.26 | 18,960.00 | 23.20 | 22.20 | 21.30 | 20 | 30 | Shrub grassland/(3) |
| 46 | I-46 | 15.67 | 688.52 | 18.20 | 16.10 | 88.25 | 15,360.00 | 23.10 | 22.10 | 21.20 | 22 | 30 | Shrub grassland/(3) |
| 47 | I-47 | 15.67 | 688.52 | 18.20 | 16.10 | 88.25 | 15,360.00 | 23.10 | 22.10 | 21.20 | 22 | 30 | Shrub grassland/(3) |
| 48 | I-48 | 15.67 | 688.52 | 18.20 | 16.10 | 88.25 | 15,360.00 | 23.10 | 22.10 | 21.20 | 22 | 30 | Shrub grassland/(3) |
| 49 | I-49 | 15.67 | 688.52 | 18.30 | 16.50 | 90.62 | 18,157.00 | 23.20 | 21.90 | 21.00 | 0 | 45 | Slope farmland/(5) |
| 50 | I-50 | 15.67 | 688.52 | 18.30 | 16.50 | 90.62 | 18,157.00 | 23.20 | 21.90 | 21.00 | 0 | 45 | Slope farmland/(5) |
| 51 | I-51 | 15.67 | 688.52 | 18.30 | 16.50 | 90.62 | 18,157.00 | 23.20 | 21.90 | 21.00 | 0 | 45 | Slope farmland/(5) |
| 52 | I-52 | 15.67 | 688.52 | 17.40 | 15.50 | 89.19 | 10,613.00 | 22.60 | 22.10 | 20.70 | 5 | 30 | Slope farmland/(5) |
| 53 | I-53 | 15.67 | 688.52 | 17.40 | 15.50 | 89.19 | 10,613.00 | 22.60 | 22.10 | 20.70 | 5 | 30 | Slope farmland/(5) |
| 54 | I-54 | 15.67 | 688.52 | 17.40 | 15.50 | 89.19 | 10,613.00 | 22.60 | 22.10 | 20.70 | 5 | 30 | Slope farmland/(5) |
| 55 | I-55 | 15.67 | 688.52 | 23.60 | 20.70 | 88.11 | 50,733.00 | 22.50 | 21.50 | 19.80 | 2 | 30 | Slope farmland/(5) |
| 56 | I-56 | 15.67 | 688.52 | 23.60 | 20.70 | 88.11 | 50,733.00 | 22.50 | 21.50 | 19.80 | 2 | 30 | Slope farmland/(5) |
| 57 | I-57 | 15.67 | 688.52 | 23.60 | 20.70 | 88.11 | 50,733.00 | 22.50 | 21.50 | 19.80 | 2 | 30 | Slope farmland/(5) |
| 58 | I-58 | 15.67 | 688.52 | 25.10 | 20.40 | 81.13 | 17,667.00 | 22.80 | 21.60 | 19.90 | 5 | 95 | Shrub grassland/(3) |
| 59 | I-59 | 15.67 | 688.52 | 25.10 | 20.40 | 81.13 | 17,667.00 | 22.80 | 21.60 | 19.90 | 5 | 95 | Shrub grassland/(3) |
| 60 | I-60 | 15.67 | 688.52 | 25.10 | 20.40 | 81.13 | 17,667.00 | 22.80 | 21.60 | 19.90 | 5 | 95 | Shrub grassland/(3) |
| **Supplementary table S3**(continued) | | | | | | | | | | | | | |
| Serial number | No. of sample plot | Average annual temperature  (℃) | Average annual precipitation  (mm) | Dryness  (%) | Humidity  (%) | Relative humidity  (%) | Light intensity  (lux) | Soil temperature-5cm  (℃) | Soil temperature-10cm  (℃) | Soil temperature-15cm  (℃) | Percentage of exposed rock  (%) | Vegetation cover rate  (%) | Land cover  /( Assigned value) |
| 61 | II-1 | 16.36 | 479.70 | 20.10 | 16.60 | 88.95 | 15,695.00 | 19.60 | 18.20 | 17.60 | 70 | 32 | Open woodland/(2) |
| 62 | II-2 | 16.36 | 479.70 | 20.10 | 16.60 | 88.95 | 15,695.00 | 19.60 | 18.20 | 17.60 | 72 | 32 | Open woodland/(2) |
| 63 | II-3 | 16.36 | 479.70 | 20.10 | 16.60 | 88.95 | 15,695.00 | 19.60 | 18.20 | 17.60 | 71 | 32 | Open woodland/(2) |
| 64 | II-4 | 16.36 | 479.70 | 20.00 | 15.20 | 86.52 | 16,669.00 | 19.20 | 18.20 | 17.50 | 71 | 30 | Open woodland/(2) |
| 65 | II-5 | 16.36 | 479.70 | 20.00 | 15.20 | 86.52 | 16,669.00 | 19.20 | 18.20 | 17.50 | 72 | 30 | Open woodland/(2) |
| 66 | II-6 | 16.36 | 479.70 | 20.00 | 15.20 | 86.52 | 16,669.00 | 19.20 | 18.20 | 17.50 | 73 | 30 | Open woodland/(2) |
| 67 | II-7 | 16.36 | 479.70 | 19.80 | 15.60 | 86.88 | 17,669.00 | 19.10 | 18.30 | 17.50 | 70 | 30 | Open woodland/(2) |
| 68 | II-8 | 16.36 | 479.70 | 19.80 | 15.60 | 86.88 | 17,669.00 | 19.10 | 18.30 | 17.50 | 70 | 30 | Open woodland/(2) |
| 69 | II-9 | 16.36 | 479.70 | 19.80 | 15.60 | 86.88 | 17,669.00 | 19.10 | 18.30 | 17.50 | 70 | 30 | Open woodland/(2) |
| 70 | II-10 | 16.36 | 479.70 | 19.70 | 15.70 | 85.63 | 18,258.00 | 19.20 | 18.30 | 17.50 | 71 | 40 | Open woodland/(2) |
| 71 | II-11 | 16.36 | 479.70 | 19.70 | 15.70 | 85.63 | 18,258.00 | 19.20 | 18.30 | 17.50 | 70 | 40 | Open woodland/(2) |
| 72 | II-12 | 16.36 | 479.70 | 19.70 | 15.70 | 85.63 | 18,258.00 | 19.20 | 18.30 | 17.50 | 71 | 40 | Open woodland/(2) |
| 73 | II-13 | 16.36 | 479.70 | 15.90 | 15.10 | 94.98 | 3,993.00 | 18.80 | 18.10 | 17.40 | 62 | 35 | Shrub grassland/(3) |
| 74 | II-14 | 16.36 | 479.70 | 15.90 | 15.10 | 94.98 | 3,993.00 | 18.80 | 18.10 | 17.40 | 62 | 35 | Shrub grassland/(3) |
| 75 | II-15 | 16.36 | 479.70 | 15.90 | 15.10 | 94.98 | 3,993.00 | 18.80 | 18.10 | 17.40 | 62 | 35 | Shrub grassland/(3) |
| 76 | II-16 | 16.36 | 479.70 | 19.20 | 16.80 | 87.86 | 28,587.00 | 18.70 | 18.10 | 17.50 | 60 | 40 | Open woodland/(2) |
| 77 | II-17 | 16.36 | 479.70 | 19.20 | 16.80 | 87.86 | 28,587.00 | 18.70 | 18.10 | 17.50 | 60 | 40 | Open woodland/(2) |
| 78 | II-18 | 16.36 | 479.70 | 19.20 | 16.80 | 87.86 | 28,587.00 | 18.70 | 18.10 | 17.50 | 60 | 40 | Open woodland/(2) |
| 79 | II-19 | 16.36 | 479.70 | 15.40 | 14.80 | 95.70 | 3,857.00 | 19.30 | 18.00 | 17.30 | 60 | 40 | Open woodland/(2) |
| 80 | II-20 | 16.36 | 479.70 | 15.40 | 14.80 | 95.70 | 3,857.00 | 19.30 | 18.00 | 17.30 | 60 | 40 | Open woodland/(2) |
| 81 | II-21 | 16.36 | 479.70 | 15.40 | 14.80 | 95.70 | 3,857.00 | 19.30 | 18.00 | 17.30 | 60 | 40 | Open woodland/(2) |
| 82 | II-22 | 16.36 | 479.70 | － | － | － | － | － | － | － | 60 | 70 | Open woodland/(2) |
| 83 | II-23 | 16.36 | 479.70 | － | － | － | － | － | － | － | 60 | 70 | Open woodland/(2) |
| 84 | II-24 | 16.36 | 479.70 | － | － | － | － | － | － | － | 60 | 70 | Open woodland/(2) |
| 85 | II-25 | 16.36 | 479.70 | 18.80 | 16.80 | 89.28 | 20,483.00 | 18.40 | 17.70 | 17.10 | 45 | 40 | Shrub grassland/(3) |
| 86 | II-26 | 16.36 | 479.70 | 18.80 | 16.80 | 89.28 | 20,483.00 | 18.40 | 17.70 | 17.10 | 45 | 40 | Shrub grassland/(3) |
| 87 | II-27 | 16.36 | 479.70 | 18.80 | 16.80 | 89.28 | 20,483.00 | 18.40 | 17.70 | 17.10 | 45 | 40 | Shrub grassland/(3) |
| 88 | II-28 | 16.36 | 479.70 | 19.30 | 17.20 | 88.94 | 3,880.00 | 18.50 | 17.90 | 17.10 | 43 | 35 | Shrub grassland/(3) |
| 89 | II-29 | 16.36 | 479.70 | 19.30 | 17.20 | 88.94 | 3,880.00 | 18.50 | 17.90 | 17.10 | 43 | 35 | Shrub grassland/(3) |
| 90 | II-30 | 16.36 | 479.70 | 19.30 | 17.20 | 88.94 | 3,880.00 | 18.50 | 17.90 | 17.10 | 43 | 35 | Shrub grassland/(3) |
| **Supplementary table S3**(continued) | | | | | | | | | | | | | |
| Serial number | No. of sample plot | Average annual temperature  (℃) | Average annual precipitation  (mm) | Dryness  (%) | Humidity  (%) | Relative humidity  (%) | Light intensity  (lux) | Soil temperature-5cm  (℃) | Soil temperature-10cm  (℃) | Soil temperature-15cm  (℃) | Percentage of exposed rock  (%) | Vegetation cover rate  (%) | Land cover  /( Assigned value) |
| 91 | II-31 | 16.36 | 479.70 | 19.10 | 17.10 | 89.12 | 16,085.00 | 18.50 | 17.80 | 17.00 | 45 | 35 | Shrub grassland/(3) |
| 92 | II-32 | 16.36 | 479.70 | 19.10 | 17.10 | 89.12 | 16,085.00 | 18.50 | 17.80 | 17.00 | 45 | 35 | Shrub grassland/(3) |
| 93 | II-33 | 16.36 | 479.70 | 19.10 | 17.10 | 89.12 | 16,085.00 | 18.50 | 17.80 | 17.00 | 45 | 35 | Shrub grassland/(3) |
| 94 | II-34 | 16.36 | 479.70 | 15.60 | 14.90 | 95.60 | 13,167.00 | 19.30 | 18.10 | 17.40 | 43 | 65 | Shrub grassland/(3) |
| 95 | II-35 | 16.36 | 479.70 | 15.60 | 14.90 | 95.60 | 13,167.00 | 19.30 | 18.10 | 17.40 | 43 | 65 | Shrub grassland/(3) |
| 96 | II-36 | 16.36 | 479.70 | 15.60 | 14.90 | 95.60 | 13,167.00 | 19.30 | 18.10 | 17.40 | 43 | 65 | Shrub grassland/(3) |
| 97 | II-37 | 16.36 | 479.70 | 19.50 | 16.50 | 85.40 | 23,133.00 | 19.10 | 17.90 | 17.50 | 28 | 50 | Forest land/(1) |
| 98 | II-38 | 16.36 | 479.70 | 19.50 | 16.50 | 85.40 | 23,133.00 | 19.10 | 17.90 | 17.50 | 28 | 50 | Forest land/(1) |
| 99 | II-39 | 16.36 | 479.70 | 19.50 | 16.50 | 85.40 | 23,133.00 | 19.10 | 17.90 | 17.50 | 28 | 50 | Forest land/(1) |
| 100 | II-40 | 16.36 | 479.70 | 18.80 | 16.90 | 90.15 | 9,423.00 | 19.70 | 18.70 | 17.80 | 25 | 20 | Shrub grassland/(3) |
| 101 | II-41 | 16.36 | 479.70 | 18.80 | 16.90 | 90.15 | 9,423.00 | 19.70 | 18.70 | 17.80 | 25 | 20 | Shrub grassland/(3) |
| 102 | II-42 | 16.36 | 479.70 | 18.80 | 16.90 | 90.15 | 9,423.00 | 19.70 | 18.70 | 17.80 | 25 | 20 | Shrub grassland/(3) |
| 103 | II-43 | 16.36 | 479.70 | 18.30 | 15.90 | 87.01 | 10,720.00 | 19.30 | 18.30 | 18.00 | 21 | 65 | Grassland/(4) |
| 104 | II-44 | 16.36 | 479.70 | 18.30 | 15.90 | 87.01 | 10,720.00 | 19.30 | 18.30 | 18.00 | 21 | 65 | Grassland/(4) |
| 105 | II-45 | 16.36 | 479.70 | 18.30 | 15.90 | 87.01 | 10,720.00 | 19.30 | 18.30 | 18.00 | 21 | 65 | Grassland/(4) |
| 106 | IIII-46 | 16.36 | 479.70 | 18.40 | 16.80 | 91.69 | 7,303.00 | 19.70 | 19.70 | 18.20 | 22 | 45 | Grassland/(4) |
| 107 | II-47 | 16.36 | 479.70 | 18.40 | 16.80 | 91.69 | 7,303.00 | 19.70 | 19.70 | 18.20 | 22 | 45 | Grassland/(4) |
| 108 | II-48 | 16.36 | 479.70 | 18.40 | 16.80 | 91.69 | 7,303.00 | 19.70 | 19.70 | 18.20 | 22 | 45 | Grassland/(4) |
| 109 | II-49 | 16.36 | 479.70 | 18.90 | 17.40 | 92.47 | 12,953.00 | 19.70 | 19.50 | 18.60 | 10 | 95 | Shrub grassland/(3) |
| 110 | II-50 | 16.36 | 479.70 | 18.90 | 17.40 | 92.47 | 12,953.00 | 19.70 | 19.50 | 18.60 | 10 | 95 | Shrub grassland/(3) |
| 111 | II-51 | 16.36 | 479.70 | 18.90 | 17.40 | 92.47 | 12,953.00 | 19.70 | 19.50 | 18.60 | 10 | 95 | Shrub grassland/(3) |
| 112 | II-52 | 16.36 | 479.70 | 15.60 | 15.00 | 95.84 | 9,517.00 | 17.40 | 19.80 | 15.30 | 15 | 0 | Slope farmland/(5) |
| 113 | II-53 | 16.36 | 479.70 | 15.60 | 15.00 | 95.84 | 9,517.00 | 17.40 | 19.80 | 15.30 | 15 | 0 | Slope farmland/(5) |
| 114 | II-54 | 16.36 | 479.70 | 15.60 | 15.00 | 95.84 | 9,517.00 | 17.40 | 19.80 | 15.30 | 15 | 0 | Slope farmland/(5) |
| 115 | II-55 | 16.36 | 479.70 | 15.20 | 14.60 | 95.87 | 14,593.00 | 20.90 | 20.20 | 17.30 | 0 | 80 | Grassland/(4) |
| 116 | II-56 | 16.36 | 479.70 | 15.20 | 14.60 | 95.87 | 14,593.00 | 20.90 | 20.20 | 17.30 | 0 | 80 | Grassland/(4) |
| 117 | II-57 | 16.36 | 479.70 | 15.20 | 14.60 | 95.87 | 14,593.00 | 20.90 | 20.20 | 17.30 | 0 | 80 | Grassland/(4) |
| 118 | II-58 | 16.36 | 479.70 | 15.80 | 15.00 | 94.99 | 13,397.00 | 20.00 | 20.50 | 17.00 | 0 | 10 | Slope farmland/(5) |
| 119 | II-59 | 16.36 | 479.70 | 15.80 | 15.00 | 94.99 | 13,397.00 | 20.00 | 20.50 | 17.00 | 0 | 10 | Slope farmland/(5) |
| 120 | II-60 | 16.36 | 479.70 | 15.80 | 15.00 | 94.99 | 13,397.00 | 20.00 | 20.50 | 17.00 | 0 | 10 | Slope farmland/(5) |
| **Supplementary table S3**(continued) | | | | | | | | | | | | | |
| Serial number | No. of sample plot | Average annual temperature  (℃) | Average annual precipitation  (mm) | Dryness  (%) | Humidity  (%) | Relative humidity  (%) | Light intensity  (lux) | Soil temperature-5cm  (℃) | Soil temperature-10cm  (℃) | Soil temperature-15cm  (℃) | Percentage of exposed rock  (%) | Vegetation cover rate  (%) | Land cover  /( Assigned value) |
| 121 | III-1 | 20.27 | 893.80 | 17.70 | 16.20 | 91.70 | 8,650.00 | 21.40 | 20.40 | 17.60 | 85 | 7 | Rock land/(6) |
| 122 | III-2 | 20.27 | 893.80 | 17.70 | 16.20 | 91.70 | 8,650.00 | 21.40 | 20.40 | 17.60 | 85 | 7 | Rock land/(6) |
| 123 | III-3 | 20.27 | 893.80 | 17.70 | 16.20 | 91.70 | 8,650.00 | 21.40 | 20.40 | 17.60 | 85 | 7 | Rock land/(6) |
| 124 | III-4 | 20.27 | 893.80 | 18.50 | 17.10 | 87.59 | 16,340.00 | 22.40 | 21.60 | 19.20 | 88 | 9 | Rock land/(6) |
| 125 | III-5 | 20.27 | 893.80 | 18.50 | 17.10 | 87.59 | 16,340.00 | 22.40 | 21.60 | 19.20 | 88 | 9 | Rock land/(6) |
| 126 | III-6 | 20.27 | 893.80 | 18.50 | 17.10 | 87.59 | 16,340.00 | 22.40 | 21.60 | 19.20 | 88 | 9 | Rock land/(6) |
| 127 | III-7 | 20.27 | 893.80 | 19.00 | 17.90 | 94.39 | 10,450.00 | 24.10 | 22.40 | 20.40 | 82 | 8 | Rock land/(6) |
| 128 | III-8 | 20.27 | 893.80 | 19.00 | 17.90 | 94.39 | 10,450.00 | 24.10 | 22.40 | 20.40 | 82 | 8 | Rock land/(6) |
| 129 | III-9 | 20.27 | 893.80 | 19.00 | 17.90 | 94.39 | 10,450.00 | 24.10 | 22.40 | 20.40 | 82 | 8 | Rock land/(6) |
| 130 | III-10 | 20.27 | 893.80 | 18.80 | 17.60 | 89.65 | 12,360.00 | 23.80 | 22.30 | 20.80 | 70 | 25 | Open woodland/(2) |
| 131 | III-11 | 20.27 | 893.80 | 18.80 | 17.60 | 89.65 | 12,360.00 | 23.80 | 22.30 | 20.80 | 72 | 25 | Open woodland/(2) |
| 132 | III-12 | 20.27 | 893.80 | 18.80 | 17.60 | 89.65 | 12,360.00 | 23.80 | 22.30 | 20.80 | 72 | 25 | Open woodland/(2) |
| 133 | III-13 | 20.27 | 893.80 | 19.00 | 17.60 | 92.78 | 7,737.00 | 23.60 | 21.80 | 21.10 | 62 | 13 | Open woodland/(2) |
| 134 | III-14 | 20.27 | 893.80 | 19.00 | 17.60 | 92.78 | 7,737.00 | 23.60 | 21.80 | 21.10 | 62 | 13 | Open woodland/(2) |
| 135 | III-15 | 20.27 | 893.80 | 19.00 | 17.60 | 92.78 | 7,737.00 | 23.60 | 21.80 | 21.10 | 62 | 13 | Open woodland/(2) |
| 136 | III-16 | 20.27 | 893.80 | 18.70 | 16.10 | 86.65 | 7,323.00 | 23.80 | 22.20 | 20.80 | 60 | 16 | Shrub grassland/(3) |
| 137 | III-17 | 20.27 | 893.80 | 18.70 | 16.10 | 86.65 | 7,323.00 | 23.80 | 22.20 | 20.80 | 60 | 16 | Shrub grassland/(3) |
| 138 | III-18 | 20.27 | 893.80 | 18.70 | 16.10 | 86.65 | 7,323.00 | 23.80 | 22.20 | 20.80 | 60 | 16 | Shrub grassland/(3) |
| 139 | III-19 | 20.27 | 893.80 | 19.00 | 17.20 | 90.25 | 7,536.00 | 23.60 | 22.10 | 20.90 | 58 | 15 | Shrub grassland/(3) |
| 140 | III-20 | 20.27 | 893.80 | 19.00 | 17.20 | 90.25 | 7,536.00 | 23.60 | 22.10 | 20.90 | 58 | 15 | Shrub grassland/(3) |
| 141 | III-21 | 20.27 | 893.80 | 19.00 | 17.20 | 90.25 | 7,536.00 | 23.60 | 22.10 | 20.90 | 58 | 15 | Shrub grassland/(3) |
| 142 | III-22 | 20.27 | 893.80 | 18.80 | 16.60 | 87.26 | 7,421.00 | 23.80 | 22.20 | 20.70 | 60 | 16 | Shrub grassland/(3) |
| 143 | III-23 | 20.27 | 893.80 | 18.80 | 16.60 | 87.26 | 7,421.00 | 23.80 | 22.20 | 20.70 | 60 | 16 | Shrub grassland/(3) |
| 144 | III-24 | 20.27 | 893.80 | 18.80 | 16.60 | 87.26 | 7,421.00 | 23.80 | 22.20 | 20.70 | 60 | 16 | Shrub grassland/(3) |
| 145 | III-25 | 20.27 | 893.80 | 19.30 | 17.30 | 89.22 | 9,170.00 | 23.50 | 22.10 | 20.70 | 45 | 14 | Shrub grassland/(3) |
| 146 | III-26 | 20.27 | 893.80 | 19.30 | 17.30 | 89.22 | 9,170.00 | 23.50 | 22.10 | 20.70 | 45 | 14 | Shrub grassland/(3) |
| 147 | III-27 | 20.27 | 893.80 | 19.30 | 17.30 | 89.22 | 9,170.00 | 23.50 | 22.10 | 20.70 | 45 | 14 | Shrub grassland/(3) |
| 148 | III-28 | 20.27 | 893.80 | 17.20 | 15.60 | 90.60 | 7,830.00 | 23.80 | 22.20 | 20.60 | 42 | 16 | Open woodland/(2) |
| 149 | III-29 | 20.27 | 893.80 | 17.20 | 15.60 | 90.60 | 7,830.00 | 23.80 | 22.20 | 20.60 | 42 | 16 | Open woodland/(2) |
| 150 | III-30 | 20.27 | 893.80 | 17.20 | 15.60 | 90.60 | 7,830.00 | 23.80 | 22.20 | 20.60 | 42 | 16 | Open woodland/(2) |
| **Supplementary table S3**(continued) | | | | | | | | | | | | | |
| Serial number | No. of sample plot | Average annual temperature  (℃) | Average annual precipitation  (mm) | Dryness  (%) | Humidity  (%) | Relative humidity  (%) | Light intensity  (lux) | Soil temperature-5cm  (℃) | Soil temperature-10cm  (℃) | Soil temperature-15cm  (℃) | Percentage of exposed rock  (%) | Vegetation cover rate  (%) | Land cover  /( Assigned value) |
| 151 | III-31 | 20.27 | 893.80 | 18.00 | 16.70 | 93.12 | 11,287.00 | 23.00 | 21.70 | 20.50 | 49 | 17 | Open woodland/(2) |
| 152 | III-32 | 20.27 | 893.80 | 18.00 | 16.70 | 93.12 | 11,287.00 | 23.00 | 21.70 | 20.50 | 49 | 17 | Open woodland/(2) |
| 153 | III-33 | 20.27 | 893.80 | 18.00 | 16.70 | 93.12 | 11,287.00 | 23.00 | 21.70 | 20.50 | 49 | 17 | Open woodland/(2) |
| 154 | III-34 | 20.27 | 893.80 | － | － | － | － | 24.30 | 23.50 | 22.60 | 49 | 18 | Open woodland/(2) |
| 155 | III-35 | 20.27 | 893.80 | － | － | － | － | 24.30 | 23.50 | 22.60 | 48 | 18 | Open woodland/(2) |
| 156 | III-36 | 20.27 | 893.80 | － | － | － | － | 24.30 | 23.50 | 22.60 | 48 | 18 | Open woodland/(2) |
| 157 | III-37 | 20.27 | 893.80 | 19.20 | 16.50 | 86.37 | 16,290.00 | 23.00 | 21.40 | 20.50 | 29 | 18 | Open woodland/(2) |
| 158 | III-38 | 20.27 | 893.80 | 19.20 | 16.50 | 86.37 | 16,290.00 | 23.00 | 21.40 | 20.50 | 29 | 18 | Open woodland/(2) |
| 159 | III-39 | 20.27 | 893.80 | 19.20 | 16.50 | 86.37 | 16,290.00 | 23.00 | 21.40 | 20.50 | 29 | 18 | Open woodland/(2) |
| 160 | III-40 | 20.27 | 893.80 | 17.20 | 15.70 | 91.40 | 8,650.00 | 23.40 | 22.10 | 21.10 | 29 | 21 | Open woodland/(2) |
| 161 | III-41 | 20.27 | 893.80 | 17.20 | 15.70 | 91.40 | 8,650.00 | 23.40 | 22.10 | 21.10 | 28 | 21 | Open woodland/(2) |
| 162 | III-42 | 20.27 | 893.80 | 17.20 | 15.70 | 91.40 | 8,650.00 | 23.40 | 22.10 | 21.10 | 28 | 21 | Open woodland/(2) |
| 163 | III-43 | 20.27 | 893.80 | 17.20 | 16.00 | 93.10 | 10,717.00 | 23.20 | 21.70 | 19.70 | 29 | 20 | Open woodland/(2) |
| 164 | III-44 | 20.27 | 893.80 | 17.20 | 16.00 | 93.10 | 10,717.00 | 23.20 | 21.70 | 19.70 | 29 | 20 | Open woodland/(2) |
| 165 | III-45 | 20.27 | 893.80 | 17.20 | 16.00 | 93.10 | 10,717.00 | 23.20 | 21.70 | 19.70 | 29 | 20 | Open woodland/(2) |
| 166 | III-46 | 20.27 | 893.80 | 17.60 | 16.10 | 89.65 | 7,896.00 | 23.30 | 21.80 | 19.80 | 28 | 20 | Open woodland/(2) |
| 167 | III-47 | 20.27 | 893.80 | 17.60 | 16.10 | 89.65 | 7,896.00 | 23.30 | 21.80 | 19.80 | 28 | 20 | Open woodland/(2) |
| 168 | III-48 | 20.27 | 893.80 | 17.60 | 16.10 | 89.65 | 7,896.00 | 23.30 | 21.80 | 19.80 | 28 | 20 | Open woodland/(2) |
| 169 | III-49 | 20.27 | 893.80 | 18.10 | 15.90 | 87.68 | 4,123.00 | 23.50 | 22.40 | 21.30 | 20 | 80 | Shrub grassland/(3) |
| 170 | III-50 | 20.27 | 893.80 | 18.10 | 15.90 | 87.68 | 4,123.00 | 23.50 | 22.40 | 21.30 | 20 | 80 | Shrub grassland/(3) |
| 171 | III-51 | 20.27 | 893.80 | 18.10 | 15.90 | 87.68 | 4,123.00 | 23.50 | 22.40 | 21.30 | 20 | 80 | Shrub grassland/(3) |
| 172 | III-52 | 20.27 | 893.80 | 18.20 | 16.20 | 93.62 | 5,236.00 | 23.10 | 22.10 | 20.60 | 15 | 85 | Shrub grassland/(3) |
| 173 | III-53 | 20.27 | 893.80 | 18.20 | 16.20 | 93.62 | 5,236.00 | 23.10 | 22.10 | 20.60 | 15 | 85 | Shrub grassland/(3) |
| 174 | III-54 | 20.27 | 893.80 | 18.20 | 16.20 | 93.62 | 5,236.00 | 23.10 | 22.10 | 20.60 | 15 | 85 | Shrub grassland/(3) |
| 175 | III-55 | 20.27 | 893.80 | 18.00 | 16.10 | 92.53 | 5,693.00 | 23.20 | 22.30 | 19.90 | 18 | 90 | Shrub grassland/(3) |
| 176 | III-56 | 20.27 | 893.80 | 18.00 | 16.10 | 92.53 | 5,693.00 | 23.20 | 22.30 | 19.90 | 18 | 90 | Shrub grassland/(3) |
| 177 | III-57 | 20.27 | 893.80 | 18.00 | 16.10 | 92.53 | 5,693.00 | 23.20 | 22.30 | 19.90 | 18 | 90 | Shrub grassland/(3) |
| 178 | III-58 | 20.27 | 893.80 | 18.20 | 16.20 | 93.65 | 4,785.00 | 23.30 | 21.80 | 20.20 | 19 | 90 | Shrub grassland/(3) |
| 179 | III-59 | 20.27 | 893.80 | 18.20 | 16.20 | 93.65 | 4,785.00 | 23.30 | 21.80 | 20.20 | 19 | 90 | Shrub grassland/(3) |
| 180 | III-60 | 20.27 | 893.80 | 18.20 | 16.20 | 93.65 | 4,785.00 | 23.30 | 21.80 | 20.20 | 18 | 90 | Shrub grassland/(3) |