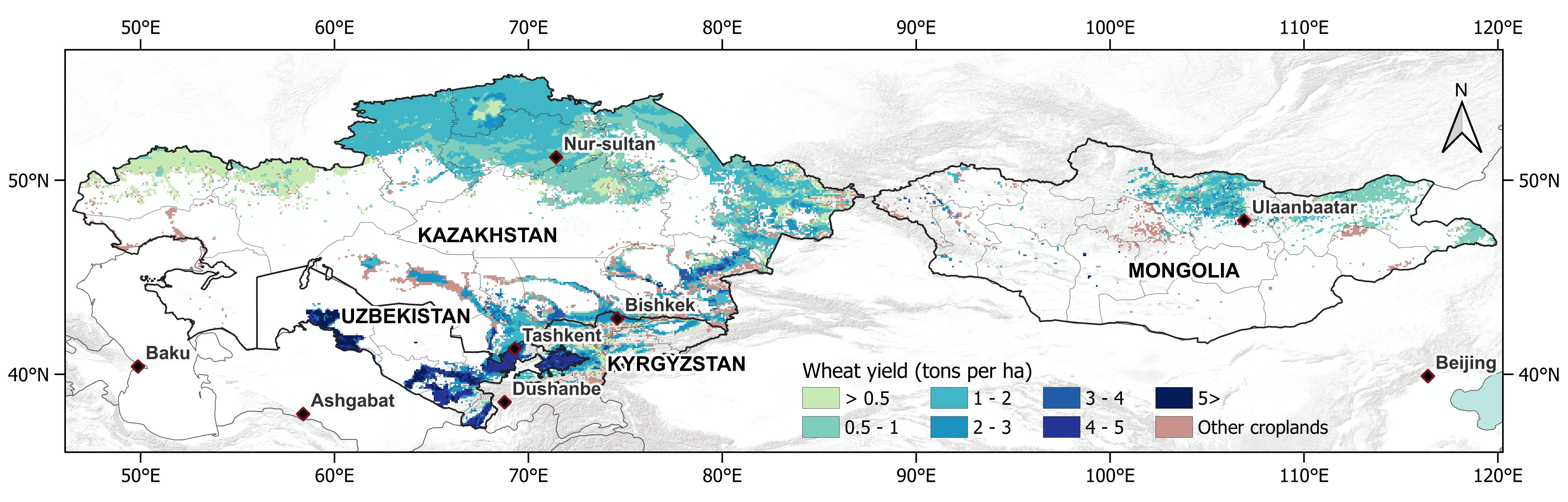
**SUPPLEMENTARY MATERIALS**

**THE ROLE OF CROP CLASSIFICATION IN DETECTING WHEAT YIELD VARIATION FOR INDEX-BASED AGRICULTURAL INSURANCE IN ARID AND SEMIARID ENVIRONMENTS**

# Appendix A



### Figure A.1. Location of croplands, wheat cultivated areas and average wheat yield in Central Asia and Mongolia. Source: Authors’ presentation based on data from Yu et al. (2020).

### Table A.2. Descriptive statistics of wheat yield data (ton/ha)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Number** | **Country** | **Province** | **District** | **Farming system** | **Period of yield data** | **MAX** | **MEAN** | **MIN** | **SD** | **RSD(%)** |
| 1 | Kazakhstan | Akmola | Akkol | rainfed | 2000-2015 | 1.27 | 0.85 | 0.40 | 0.26 | 30.5 |
| 2 | Kazakhstan | Akmola | Arshaly | rainfed | 2000-2015 | 1.26 | 0.93 | 0.63 | 0.20 | 21.3 |
| 3 | Kazakhstan | Akmola | Astrakhan | rainfed | 2000-2015 | 1.26 | 0.84 | 0.39 | 0.22 | 26.7 |
| 4 | Kazakhstan | Akmola | Atbasar | rainfed | 2000-2015 | 1.50 | 0.91 | 0.51 | 0.26 | 28.6 |
| 5 | Kazakhstan | Akmola | Bulandy | rainfed | 2000-2015 | 1.58 | 0.96 | 0.63 | 0.28 | 28.9 |
| 6 | Kazakhstan | Akmola | Burabay | rainfed | 2000-2015 | 1.79 | 1.13 | 0.66 | 0.29 | 25.9 |
| 7 | Kazakhstan | Akmola | Egindykol | rainfed | 2000-2015 | 1.20 | 0.78 | 0.43 | 0.22 | 28.6 |
| 8 | Kazakhstan | Akmola | Enbekshilder | rainfed | 2000-2015 | 1.58 | 1.09 | 0.41 | 0.38 | 34.6 |
| 9 | Kazakhstan | Akmola | Ereymentau | rainfed | 2000-2015 | 1.14 | 0.67 | 0.37 | 0.22 | 33.2 |
| 10 | Kazakhstan | Akmola | Esil | rainfed | 2000-2015 | 1.94 | 0.85 | 0.31 | 0.37 | 43.3 |
| 11 | Kazakhstan | Akmola | Korganzhyn | rainfed | 2000-2015 | 1.04 | 0.63 | 0.37 | 0.21 | 33.0 |
| 12 | Kazakhstan | Akmola | Sandyktau | rainfed | 2000-2015 | 1.81 | 1.15 | 0.75 | 0.27 | 23.5 |
| 13 | Kazakhstan | Akmola | Shortandy | rainfed | 2000-2015 | 1.25 | 0.95 | 0.42 | 0.23 | 24.3 |
| 14 | Kazakhstan | Akmola | Tselinograd | rainfed | 2000-2015 | 1.11 | 0.83 | 0.42 | 0.20 | 23.7 |
| 15 | Kazakhstan | Akmola | Zerendi | rainfed | 2000-2015 | 2.22 | 1.20 | 0.51 | 0.37 | 31.1 |
| 16 | Kazakhstan | Akmola | Zhaksy | rainfed | 2000-2015 | 2.04 | 1.08 | 0.51 | 0.39 | 36.1 |
| 17 | Kazakhstan | Akmola | Zharkayyk | rainfed | 2000-2015 | 1.69 | 0.88 | 0.44 | 0.30 | 33.9 |
| 18 | Kazakhstan | Akmola | city.Kokshetau | rainfed | 2000-2015 | 1.68 | 0.63 | 0.16 | 0.37 | 59.0 |
| 19 | Kazakhstan | Akmola | city.Stepnogor | rainfed | 2000-2015 | 1.16 | 0.52 | 0.00 | 0.36 | 69.8 |
| 20 | Kazakhstan | Kostanay | Altynsarin | rainfed | 2000-2015 | 1.91 | 1.15 | 0.55 | 0.36 | 31.4 |
| 21 | Kazakhstan | Kostanay | Amangeldi | rainfed | 2000-2015 | 1.39 | 0.80 | 0.35 | 0.27 | 33.7 |
| 22 | Kazakhstan | Kostanay | Auliekal | rainfed | 2000-2015 | 1.64 | 0.88 | 0.35 | 0.31 | 35.2 |
| 23 | Kazakhstan | Kostanay | Denisov | rainfed | 2000-2015 | 1.92 | 1.08 | 0.48 | 0.38 | 35.6 |
| 24 | Kazakhstan | Kostanay | Fedorov | rainfed | 2000-2015 | 2.29 | 1.46 | 1.00 | 0.34 | 23.4 |
| 25 | Kazakhstan | Kostanay | Kamysty | rainfed | 2000-2015 | 1.31 | 0.88 | 0.34 | 0.27 | 31.1 |
| 26 | Kazakhstan | Kostanay | Karabalyk | rainfed | 2000-2015 | 2.01 | 1.31 | 0.82 | 0.32 | 24.6 |
| 27 | Kazakhstan | Kostanay | Karasu | rainfed | 2000-2015 | 1.97 | 1.06 | 0.55 | 0.35 | 33.0 |
| 28 | Kazakhstan | Kostanay | Kostanay | rainfed | 2000-2015 | 2.21 | 1.33 | 0.82 | 0.39 | 29.0 |
| 29 | Kazakhstan | Kostanay | Mendykara | rainfed | 2000-2015 | 1.98 | 1.29 | 0.81 | 0.29 | 22.7 |
| 30 | Kazakhstan | Kostanay | Nauryzym | rainfed | 2000-2015 | 1.29 | 0.80 | 0.29 | 0.27 | 34.2 |
| 31 | Kazakhstan | Kostanay | Sarykol | rainfed | 2000-2015 | 2.16 | 1.28 | 0.64 | 0.39 | 30.6 |
| 32 | Kazakhstan | Kostanay | Taran | rainfed | 2000-2015 | 1.90 | 1.03 | 0.52 | 0.35 | 33.6 |
| 33 | Kazakhstan | Kostanay | Uzynkol | rainfed | 2000-2015 | 2.06 | 1.27 | 0.79 | 0.35 | 27.6 |
| 34 | Kazakhstan | Kostanay | Zhangeldin | rainfed | 2000-2015 | 1.25 | 0.65 | 0.20 | 0.24 | 36.4 |
| 35 | Kazakhstan | Kostanay | Zhitikarin | rainfed | 2000-2015 | 1.18 | 0.76 | 0.28 | 0.23 | 30.2 |
| 36 | Kazakhstan | Kostanay | city Arkalyk | rainfed | 2000-2015 | 1.60 | 0.89 | 0.35 | 0.31 | 34.6 |
| 37 | Kazakhstan | Kostanay | city Kostanay | rainfed | 2000-2015 | 1.98 | 0.75 | 0.00 | 0.56 | 74.5 |
| 38 | Kazakhstan | N. Kazakhstan | Akkayyn | rainfed | 2000-2015 | 2.17 | 1.46 | 0.94 | 0.34 | 23.6 |
| 39 | Kazakhstan | N. Kazakhstan | Akzhar | rainfed | 2000-2015 | 1.58 | 1.05 | 0.57 | 0.33 | 31.3 |
| 40 | Kazakhstan | N. Kazakhstan | Ayyrtau | rainfed | 2000-2015 | 2.30 | 1.26 | 0.77 | 0.38 | 30.2 |
| 41 | Kazakhstan | N. Kazakhstan | Esil | rainfed | 2000-2015 | 2.34 | 1.44 | 1.00 | 0.35 | 24.0 |
| 42 | Kazakhstan | N. Kazakhstan | Gabil.Musirepov | rainfed | 2000-2015 | 2.25 | 1.25 | 0.72 | 0.39 | 31.0 |
| 43 | Kazakhstan | N. Kazakhstan | Kyzylzhar | rainfed | 2000-2015 | 2.37 | 1.58 | 1.21 | 0.34 | 21.6 |
| 44 | Kazakhstan | N. Kazakhstan | M. Zhambaev | rainfed | 2000-2015 | 2.19 | 1.44 | 0.99 | 0.34 | 23.6 |
| 45 | Kazakhstan | N. Kazakhstan | Mamlyut | rainfed | 2000-2015 | 2.10 | 1.43 | 1.08 | 0.28 | 19.8 |
| 46 | Kazakhstan | N. Kazakhstan | Shal.Akyna | rainfed | 2000-2015 | 1.91 | 1.18 | 0.78 | 0.30 | 25.5 |
| 47 | Kazakhstan | N. Kazakhstan | Taiynsha | rainfed | 2000-2015 | 1.91 | 1.20 | 0.57 | 0.30 | 25.4 |
| 48 | Kazakhstan | N. Kazakhstan | Timiryazev | rainfed | 2000-2015 | 2.55 | 1.22 | 0.76 | 0.45 | 36.9 |
| 49 | Kazakhstan | N. Kazakhstan | Ualikhanov | rainfed | 2000-2015 | 1.51 | 1.01 | 0.58 | 0.32 | 31.5 |
| 50 | Kazakhstan | N. Kazakhstan | Zhambyl | rainfed | 2000-2015 | 1.94 | 1.23 | 0.76 | 0.33 | 27.2 |
| 51 | Kyrgyzstan | Chuy | Alamudun | mixed | 2007-2017 | 2.95 | 2.48 | 1.77 | 0.46 | 18.5 |
| 52 | Kyrgyzstan | Chuy | Chui | mixed | 2007-2017 | 2.87 | 2.46 | 1.93 | 0.36 | 14.5 |
| 53 | Kyrgyzstan | Chuy | Jaiyl | mixed | 2007-2017 | 2.76 | 2.09 | 1.09 | 0.58 | 27.7 |
| 54 | Kyrgyzstan | Chuy | Kemin | mixed | 2007-2017 | 2.93 | 2.23 | 1.42 | 0.46 | 20.8 |
| 55 | Kyrgyzstan | Chuy | Moscow | mixed | 2007-2017 | 2.70 | 2.11 | 1.18 | 0.52 | 24.5 |
| 56 | Kyrgyzstan | Chuy | Panfilov | mixed | 2007-2017 | 2.36 | 1.92 | 1.11 | 0.45 | 23.4 |
| 57 | Kyrgyzstan | Chuy | Sokuluk | mixed | 2007-2017 | 2.97 | 2.38 | 1.48 | 0.50 | 21.1 |
| 58 | Kyrgyzstan | Chuy | Ysyk.Ata | mixed | 2007-2017 | 3.30 | 2.67 | 1.88 | 0.42 | 15.8 |
| 59 | Mongolia | Bulgan | Bayan.Agt | rainfed | 2000-2018 | 3.07 | 1.14 | 0.08 | 0.71 | 62.0 |
| 60 | Mongolia | Bulgan | Bugat | rainfed | 2000-2018 | 2.00 | 1.25 | 0.75 | 0.41 | 33.0 |
| 61 | Mongolia | Bulgan | Bureghangai | rainfed | 2000-2018 | 1.84 | 0.94 | 0.18 | 0.49 | 52.4 |
| 62 | Mongolia | Bulgan | Dashinchilen | rainfed | 2006-2018 | 2.72 | 1.32 | 0.00 | 0.89 | 66.9 |
| 63 | Mongolia | Bulgan | Hangal | rainfed | 2000-2018 | 2.57 | 1.51 | 0.72 | 0.46 | 30.3 |
| 64 | Mongolia | Bulgan | Hishig.Undur | rainfed | 2000-2018 | 2.67 | 1.14 | 0.14 | 0.68 | 59.6 |
| 65 | Mongolia | Bulgan | Hutag.Undur | rainfed | 2000-2018 | 1.83 | 1.16 | 0.61 | 0.39 | 33.6 |
| 66 | Mongolia | Bulgan | Orhon | rainfed | 2000-2018 | 1.91 | 1.09 | 0.45 | 0.37 | 34.3 |
| 67 | Mongolia | Bulgan | Selenge | rainfed | 2000-2018 | 1.88 | 1.15 | 0.80 | 0.29 | 24.9 |
| 68 | Mongolia | Bulgan | Teshig | rainfed | 2000-2018 | 1.85 | 1.26 | 0.57 | 0.43 | 34.0 |
| 69 | Mongolia | Darhan Uul | Hongor | rainfed | 2009-2018 | 1.76 | 1.14 | 0.26 | 0.44 | 38.8 |
| 70 | Mongolia | Dornod | Halhgol | rainfed | 2000-2018 | 1.86 | 1.01 | 0.35 | 0.49 | 48.8 |
| 71 | Mongolia | Dornod | Tsagaan Ovoo | rainfed | 2000-2018 | 2.80 | 1.09 | 0.00 | 0.82 | 74.9 |
| 72 | Mongolia | Huvsgul | Erdenebulgan | rainfed | 2000-2018 | 1.52 | 0.99 | 0.29 | 0.37 | 37.2 |
| 73 | Mongolia | Huvsgul | Rashaant | rainfed | 2000-2018 | 2.39 | 1.30 | 0.31 | 0.61 | 47.2 |
| 74 | Mongolia | Huvsgul | Tarialan | rainfed | 2000-2018 | 1.98 | 1.24 | 0.52 | 0.45 | 36.1 |
| 75 | Mongolia | Orhon | Jargalant | rainfed | 2000-2018 | 3.11 | 1.55 | 0.51 | 0.77 | 49.4 |
| 76 | Mongolia | Selenge | Altanbulag | rainfed | 2000-2018 | 1.80 | 1.10 | 0.39 | 0.44 | 40.1 |
| 77 | Mongolia | Selenge | Baruunburen | rainfed | 2000-2018 | 1.60 | 0.83 | 0.02 | 0.48 | 58.1 |
| 78 | Mongolia | Selenge | Bayangol | rainfed | 2000-2018 | 1.68 | 0.95 | 0.12 | 0.45 | 46.8 |
| 79 | Mongolia | Selenge | Huder | rainfed | 2000-2018 | 1.72 | 1.05 | 0.20 | 0.38 | 36.3 |
| 80 | Mongolia | Selenge | Hushaat | rainfed | 2000-2018 | 2.40 | 1.18 | 0.15 | 0.62 | 52.2 |
| 81 | Mongolia | Selenge | Javhlant | rainfed | 2000-2018 | 1.81 | 0.99 | 0.17 | 0.46 | 46.5 |
| 82 | Mongolia | Selenge | Mandal | rainfed | 2000-2018 | 1.82 | 1.08 | 0.22 | 0.46 | 42.5 |
| 83 | Mongolia | Selenge | Orhon | rainfed | 2000-2018 | 1.56 | 0.89 | 0.14 | 0.44 | 49.8 |
| 84 | Mongolia | Selenge | Orhontuul | rainfed | 2000-2018 | 2.12 | 1.02 | 0.19 | 0.55 | 54.0 |
| 85 | Mongolia | Selenge | Saihan | rainfed | 2000-2018 | 1.90 | 1.20 | 0.20 | 0.54 | 44.7 |
| 86 | Mongolia | Selenge | Sant | rainfed | 2000-2018 | 2.15 | 0.97 | 0.15 | 0.64 | 66.2 |
| 87 | Mongolia | Selenge | Shaamar | rainfed | 2000-2018 | 1.98 | 0.87 | 0.27 | 0.44 | 51.0 |
| 88 | Mongolia | Selenge | Tsagaannuur | rainfed | 2000-2018 | 2.09 | 1.27 | 0.54 | 0.48 | 37.6 |
| 89 | Mongolia | Selenge | Tushig | rainfed | 2000-2018 | 2.66 | 1.42 | 0.37 | 0.70 | 49.1 |
| 90 | Mongolia | Selenge | Yeruu | rainfed | 2000-2018 | 2.11 | 1.20 | 0.36 | 0.49 | 40.7 |
| 91 | Mongolia | Selenge | Zuunburen | rainfed | 2000-2018 | 1.95 | 1.23 | 0.32 | 0.49 | 39.9 |
| 92 | Mongolia | Tuv | Argalant | rainfed | 2000-2018 | 2.05 | 0.91 | 0.01 | 0.71 | 78.2 |
| 93 | Mongolia | Tuv | Bayanchandmani | rainfed | 2001-2016 | 2.00 | 1.05 | 0.65 | 0.39 | 37.0 |
| 94 | Mongolia | Tuv | Bayantsogt | rainfed | 2000-2018 | 1.60 | 0.76 | 0.10 | 0.50 | 66.5 |
| 95 | Mongolia | Tuv | Bornuur | rainfed | 2000-2018 | 1.70 | 0.95 | 0.01 | 0.45 | 47.5 |
| 96 | Mongolia | Tuv | Erdenesant | rainfed | 2000-2018 | 2.12 | 0.95 | 0.03 | 0.61 | 64.3 |
| 97 | Mongolia | Tuv | Jargalant | rainfed | 2000-2018 | 1.96 | 0.94 | 0.20 | 0.48 | 51.4 |
| 98 | Mongolia | Tuv | Sumber | rainfed | 2000-2018 | 1.78 | 1.01 | 0.09 | 0.53 | 52.7 |
| 99 | Mongolia | Tuv | Tseel | rainfed | 2000-2018 | 2.67 | 1.27 | 0.08 | 0.70 | 55.3 |
| 100 | Mongolia | Tuv | Ugtaal | rainfed | 2000-2018 | 2.16 | 1.07 | 0.06 | 0.76 | 70.7 |
| 101 | Mongolia | Tuv | Zaamar | rainfed | 2000-2018 | 1.46 | 0.64 | 0.07 | 0.45 | 69.7 |
| 102 | Uzbekistan | Djizzakh | Arnasai | irrigated | 2007-2018 | 4.55 | 3.71 | 2.92 | 0.53 | 14.3 |
| 103 | Uzbekistan | Djizzakh | Mirzachol | irrigated | 2007-2018 | 1.85 | 1.42 | 0.94 | 0.33 | 23.4 |
| 104 | Uzbekistan | Djizzakh | Pakhtakor | irrigated | 2007-2018 | 5.74 | 3.85 | 3.10 | 0.92 | 23.8 |
| 105 | Uzbekistan | Djizzakh | Zafarabad | irrigated | 2007-2018 | 6.49 | 5.38 | 2.75 | 1.19 | 22.2 |
| 106 | Uzbekistan | Djizzakh | Zarbdar | irrigated | 2007-2018 | 0.82 | 0.59 | 0.09 | 0.21 | 36.1 |
| 107 | Uzbekistan | Kashkadarya | Karshi | irrigated | 2007-2018 | 1.35 | 0.90 | 0.41 | 0.27 | 30.0 |
| 108 | Uzbekistan | Kashkadarya | Kasbi | irrigated | 2007-2018 | 5.76 | 4.68 | 4.23 | 0.48 | 10.2 |
| 109 | Uzbekistan | Kashkadarya | Mirishkor | irrigated | 2007-2018 | 6.15 | 5.08 | 4.64 | 0.44 | 8.7 |
| 110 | Uzbekistan | Kashkadarya | Mubarak | irrigated | 2007-2018 | 1.43 | 0.86 | 0.14 | 0.33 | 38.2 |
| 111 | Uzbekistan | Kashkadarya | Nishan | irrigated | 2007-2018 | 5.26 | 3.98 | 2.64 | 0.65 | 16.2 |
| 112 | Uzbekistan | Khorezm | Bagat | irrigated | 2007-2018 | 2.76 | 2.28 | 1.79 | 0.30 | 13.4 |
| 113 | Uzbekistan | Khorezm | Gurlen | irrigated | 2007-2018 | 4.56 | 3.76 | 2.73 | 0.56 | 14.8 |
| 114 | Uzbekistan | Khorezm | Khanka | irrigated | 2008-2016 | 5.41 | 2.93 | 1.98 | 1.04 | 35.6 |
| 115 | Uzbekistan | Khorezm | Khazarasp | irrigated | 2009-2016 | 6.10 | 1.85 | 1.00 | 1.89 | 101.7 |
| 116 | Uzbekistan | Khorezm | Khiva | irrigated | 2008-2016 | 5.70 | 4.79 | 4.05 | 0.58 | 12.2 |
| 117 | Uzbekistan | Khorezm | Kushkupir | irrigated | 2008-2016 | 5.70 | 4.44 | 3.78 | 0.66 | 14.8 |
| 118 | Uzbekistan | Khorezm | Shavat | irrigated | 2008-2016 | 6.20 | 5.91 | 5.23 | 0.31 | 5.3 |
| 119 | Uzbekistan | Khorezm | Urgench | irrigated | 2008-2016 | 6.29 | 5.48 | 4.23 | 0.72 | 13.2 |
| 120 | Uzbekistan | Khorezm | Yangiarik | irrigated | 2008-2016 | 6.50 | 5.78 | 2.97 | 1.11 | 19.3 |
| 121 | Uzbekistan | Khorezm | Yangibazar | irrigated | 2008-2016 | 8.06 | 5.09 | 3.74 | 1.42 | 27.9 |
| 122 | Uzbekistan | Navai | Kanimekh | irrigated | 2008-2016 | 6.16 | 5.17 | 4.25 | 0.61 | 11.9 |
| 123 | Uzbekistan | Navai | Karmana | irrigated | 2008-2016 | 6.02 | 5.24 | 4.59 | 0.47 | 8.9 |
| 124 | Uzbekistan | Navai | Khatirchi | irrigated | 2008-2016 | 6.20 | 5.30 | 4.60 | 0.54 | 10.3 |
| 125 | Uzbekistan | Navai | Kiziltepa | irrigated | 2008-2016 | 8.78 | 6.12 | 4.94 | 1.17 | 19.0 |
| 126 | Uzbekistan | Navai | Navbahor | irrigated | 2008-2016 | 6.84 | 5.14 | 4.00 | 1.01 | 19.7 |
| 127 | Uzbekistan | Navai | Nurota | irrigated | 2007-2017 | 4.83 | 4.41 | 3.73 | 0.32 | 7.4 |
| 128 | Uzbekistan | Djizzakh | Djizzakh | mixed | 2007-2017 | 4.95 | 4.47 | 3.35 | 0.44 | 9.8 |
| 129 | Uzbekistan | Djizzakh | Dustlik | mixed | 2007-2017 | 5.05 | 4.46 | 3.65 | 0.46 | 10.3 |
| 130 | Uzbekistan | Kashkadarya | Chirakchi | mixed | 2007-2017 | 5.32 | 4.45 | 3.78 | 0.46 | 10.4 |
| 131 | Uzbekistan | Kashkadarya | Guzar | mixed | 2007-2017 | 4.79 | 4.42 | 3.99 | 0.28 | 6.3 |
| 132 | Uzbekistan | Kashkadarya | Kamashi | mixed | 2007-2017 | 4.87 | 4.14 | 2.88 | 0.62 | 15.0 |
| 133 | Uzbekistan | Kashkadarya | Kasan | mixed | 2007-2017 | 4.79 | 3.99 | 2.44 | 0.72 | 17.9 |
| 134 | Uzbekistan | Kashkadarya | Shakhrisabz | mixed | 2007-2017 | 5.03 | 4.46 | 3.63 | 0.39 | 8.8 |
| 135 | Uzbekistan | Kashkadarya | Yangibag | mixed | 2007-2017 | 4.80 | 4.20 | 2.95 | 0.52 | 12.5 |
| 136 | Uzbekistan | Djizzakh | Bakhmal | rainfed | 2007-2017 | 4.81 | 4.49 | 3.59 | 0.36 | 8.0 |
| 137 | Uzbekistan | Djizzakh | Farish | rainfed | 2008-2017 | 4.65 | 4.13 | 3.69 | 0.28 | 6.8 |
| 138 | Uzbekistan | Djizzakh | Gallaral | rainfed | 2008-2017 | 6.25 | 5.01 | 4.44 | 0.60 | 12.0 |
| 139 | Uzbekistan | Djizzakh | Yangiabad | rainfed | 2008-2017 | 5.61 | 5.34 | 4.98 | 0.22 | 4.1 |
| 140 | Uzbekistan | Djizzakh | Zamin | rainfed | 2008-2017 | 5.62 | 4.70 | 3.63 | 0.58 | 12.3 |
| 141 | Uzbekistan | Kashkadarya | Dekhkanabad | rainfed | 2008-2017 | 5.70 | 4.78 | 1.64 | 1.25 | 26.2 |
| 142 | Uzbekistan | Kashkadarya | Kitab | rainfed | 2008-2017 | 4.43 | 2.09 | 1.01 | 0.98 | 47.0 |

**Appendix B**

**Table B.1.** Correlation time series between NDVI and wheat yield per country and mask type

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **District borders** | | | | | | | |  | **Croplands** | | | | | | | |  | **Wheatlands** | | | | | | | |
|  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |
| **Day of year** | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |  | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |  | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |
| **17** | 0.16 | 0.20 | -0.05 | -0.06 | 0.03 | 0.10 | 0.18 | 0.27 |  | 0.16 | 0.20 | -0.04 | 0.01 | 0.05 | 0.05 | 0.23 | 0.29 |  | 0.19 | 0.22 | -0.08 | -0.03 | 0.10 | 0.10 | 0.16 | 0.26 |
| **33** | 0.19 | 0.22 | -0.06 | -0.06 | 0.10 | 0.18 | 0.19 | 0.22 |  | 0.19 | 0.22 | -0.09 | -0.05 | 0.19 | 0.24 | 0.21 | 0.24 |  | 0.20 | 0.19 | -0.12 | -0.10 | 0.26 | 0.23 | 0.22 | 0.22 |
| **49** | 0.13 | 0.16 | -0.02 | -0.02 | 0.55 | 0.61 | 0.29 | 0.45 |  | 0.13 | 0.16 | 0.00 | 0.02 | 0.59 | 0.62 | 0.32 | 0.40 |  | 0.17 | 0.18 | -0.05 | -0.03 | 0.66 | 0.64 | 0.32 | 0.39 |
| **65** | 0.12 | 0.14 | -0.09 | -0.08 | 0.32 | 0.39 | 0.25 | 0.33 |  | 0.12 | 0.14 | -0.12 | -0.09 | 0.43 | 0.52 | 0.30 | 0.36 |  | 0.13 | 0.17 | -0.14 | -0.12 | 0.50 | 0.50 | 0.32 | 0.40 |
| **81** | 0.05 | 0.09 | -0.14 | -0.16 | 0.31 | 0.40 | 0.29 | 0.34 |  | 0.05 | 0.09 | -0.13 | -0.15 | 0.49 | 0.54 | 0.33 | 0.37 |  | -0.03 | 0.00 | -0.09 | -0.08 | 0.50 | 0.50 | 0.34 | 0.41 |
| **97** | 0.14 | 0.16 | -0.06 | -0.06 | 0.20 | 0.24 | 0.23 | 0.23 |  | 0.14 | 0.16 | -0.01 | -0.04 | 0.40 | 0.42 | 0.25 | 0.23 |  | -0.06 | -0.01 | -0.02 | -0.04 | 0.17 | 0.09 | 0.25 | 0.25 |
| **113** | 0.21 | 0.19 | 0.06 | 0.04 | 0.35 | 0.44 | 0.22 | 0.26 |  | 0.21 | 0.19 | -0.03 | -0.02 | 0.65 | 0.71 | 0.23 | 0.23 |  | 0.04 | 0.07 | 0.07 | 0.04 | 0.63 | 0.67 | 0.19 | 0.21 |
| **129** | 0.12 | 0.14 | 0.11 | 0.08 | 0.45 | 0.54 | 0.13 | 0.18 |  | 0.12 | 0.14 | -0.01 | -0.05 | 0.68 | 0.75 | 0.11 | 0.10 |  | -0.03 | -0.01 | 0.06 | 0.01 | 0.59 | 0.65 | -0.06 | -0.11 |
| **145** | 0.09 | 0.05 | 0.32 | 0.34 | 0.49 | 0.59 | 0.09 | 0.13 |  | 0.09 | 0.05 | 0.14 | 0.16 | 0.78 | 0.79 | 0.06 | 0.04 |  | -0.03 | -0.05 | 0.16 | 0.14 | 0.44 | 0.55 | -0.06 | -0.12 |
| **161** | 0.23 | 0.29 | 0.31 | 0.31 | 0.63 | 0.73 | 0.11 | 0.13 |  | 0.23 | 0.29 | 0.10 | 0.13 | 0.75 | 0.74 | 0.04 | 0.09 |  | 0.15 | 0.18 | 0.11 | 0.11 | 0.19 | 0.15 | -0.12 | -0.14 |
| **177** | 0.52 | 0.58 | 0.47 | 0.50 | 0.57 | 0.61 | 0.14 | 0.21 |  | 0.52 | 0.58 | 0.40 | 0.46 | 0.76 | 0.77 | 0.15 | 0.17 |  | 0.40 | 0.36 | 0.29 | 0.32 | -0.14 | -0.20 | -0.03 | -0.01 |
| **193** | 0.59 | 0.65 | 0.62 | 0.65 | 0.49 | 0.50 | 0.13 | 0.20 |  | 0.59 | 0.65 | 0.59 | 0.65 | 0.52 | 0.49 | 0.12 | 0.12 |  | 0.52 | 0.57 | 0.53 | 0.60 | -0.49 | -0.51 | -0.04 | 0.00 |
| **209** | 0.56 | 0.57 | 0.59 | 0.60 | 0.61 | 0.67 | 0.20 | 0.27 |  | 0.56 | 0.57 | 0.54 | 0.55 | 0.49 | 0.46 | 0.21 | 0.20 |  | 0.40 | 0.47 | 0.49 | 0.53 | -0.41 | -0.40 | 0.02 | 0.02 |
| **225** | 0.41 | 0.45 | 0.49 | 0.51 | 0.72 | 0.76 | 0.18 | 0.23 |  | 0.41 | 0.45 | 0.46 | 0.51 | 0.61 | 0.59 | 0.19 | 0.17 |  | 0.18 | 0.21 | 0.41 | 0.47 | -0.32 | -0.26 | -0.03 | -0.06 |
| **241** | 0.15 | 0.18 | 0.22 | 0.27 | 0.64 | 0.65 | 0.19 | 0.24 |  | 0.15 | 0.18 | 0.18 | 0.28 | 0.72 | 0.73 | 0.16 | 0.13 |  | -0.10 | -0.09 | 0.09 | 0.17 | -0.37 | -0.37 | -0.03 | -0.06 |
| **257** | -0.01 | -0.01 | 0.08 | 0.10 | 0.70 | 0.74 | 0.09 | 0.16 |  | -0.01 | -0.01 | -0.01 | 0.06 | 0.72 | 0.74 | 0.04 | 0.02 |  | -0.20 | -0.23 | -0.07 | -0.06 | -0.25 | -0.30 | -0.12 | -0.15 |

**Table B.2.** Correlation time series between EVI and wheat yield per country and mask type

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **District borders** | | | | | | | |  | **Croplands** | | | | | | | |  | **Wheatlands** | | | | | | | |
|  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |
| **Day of year** | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |  | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |  | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |
| **17** | 0.18 | 0.20 | -0.03 | -0.03 | -0.03 | 0.02 | 0.19 | 0.26 |  | 0.18 | 0.20 | -0.02 | 0.04 | 0.03 | 0.07 | 0.19 | 0.29 |  | 0.20 | 0.22 | -0.06 | 0.02 | 0.10 | 0.07 | 0.17 | 0.26 |
| **33** | 0.22 | 0.23 | -0.06 | -0.05 | 0.09 | 0.20 | 0.19 | 0.21 |  | 0.22 | 0.23 | -0.09 | -0.05 | 0.22 | 0.29 | 0.22 | 0.21 |  | 0.22 | 0.22 | -0.12 | -0.11 | 0.30 | 0.25 | 0.20 | 0.21 |
| **49** | 0.18 | 0.21 | -0.03 | -0.03 | 0.53 | 0.65 | 0.31 | 0.45 |  | 0.18 | 0.21 | -0.01 | 0.00 | 0.59 | 0.64 | 0.31 | 0.42 |  | 0.21 | 0.20 | -0.06 | -0.03 | 0.65 | 0.64 | 0.34 | 0.41 |
| **65** | 0.16 | 0.18 | -0.13 | -0.10 | 0.25 | 0.33 | 0.21 | 0.27 |  | 0.16 | 0.18 | -0.15 | -0.13 | 0.39 | 0.51 | 0.24 | 0.32 |  | 0.17 | 0.20 | -0.16 | -0.17 | 0.49 | 0.50 | 0.29 | 0.37 |
| **81** | 0.05 | 0.07 | -0.14 | -0.16 | 0.25 | 0.37 | 0.26 | 0.33 |  | 0.05 | 0.07 | -0.13 | -0.13 | 0.44 | 0.51 | 0.25 | 0.33 |  | 0.01 | 0.07 | -0.10 | -0.11 | 0.46 | 0.41 | 0.31 | 0.37 |
| **97** | 0.26 | 0.26 | -0.06 | -0.06 | 0.16 | 0.20 | 0.21 | 0.24 |  | 0.26 | 0.26 | -0.01 | -0.04 | 0.33 | 0.34 | 0.21 | 0.23 |  | 0.17 | 0.14 | 0.00 | -0.04 | 0.15 | 0.06 | 0.26 | 0.28 |
| **113** | 0.22 | 0.25 | 0.05 | 0.02 | 0.29 | 0.37 | 0.22 | 0.26 |  | 0.22 | 0.25 | -0.03 | -0.08 | 0.56 | 0.60 | 0.23 | 0.20 |  | 0.12 | 0.12 | 0.09 | 0.07 | 0.42 | 0.48 | 0.15 | 0.14 |
| **129** | 0.16 | 0.21 | 0.10 | 0.06 | 0.47 | 0.57 | 0.12 | 0.13 |  | 0.16 | 0.21 | -0.05 | -0.07 | 0.69 | 0.76 | 0.08 | 0.05 |  | 0.17 | 0.15 | 0.08 | 0.03 | 0.52 | 0.63 | -0.08 | -0.10 |
| **145** | 0.12 | 0.11 | 0.34 | 0.37 | 0.50 | 0.60 | 0.09 | 0.11 |  | 0.12 | 0.11 | 0.15 | 0.16 | 0.77 | 0.78 | 0.02 | 0.01 |  | 0.03 | 0.01 | 0.18 | 0.17 | 0.37 | 0.48 | -0.08 | -0.12 |
| **161** | 0.26 | 0.31 | 0.33 | 0.36 | 0.61 | 0.70 | 0.04 | 0.09 |  | 0.26 | 0.31 | 0.14 | 0.13 | 0.72 | 0.71 | -0.04 | -0.04 |  | 0.20 | 0.22 | 0.15 | 0.15 | -0.02 | -0.03 | -0.16 | -0.19 |
| **177** | 0.48 | 0.57 | 0.50 | 0.54 | 0.57 | 0.60 | 0.11 | 0.17 |  | 0.48 | 0.57 | 0.44 | 0.49 | 0.74 | 0.76 | 0.07 | 0.15 |  | 0.40 | 0.40 | 0.34 | 0.40 | -0.57 | -0.59 | -0.07 | -0.05 |
| **193** | 0.61 | 0.67 | 0.61 | 0.63 | 0.41 | 0.46 | 0.08 | 0.15 |  | 0.61 | 0.67 | 0.57 | 0.64 | 0.50 | 0.47 | 0.06 | 0.08 |  | 0.53 | 0.57 | 0.51 | 0.55 | -0.63 | -0.68 | -0.07 | -0.05 |
| **209** | 0.53 | 0.55 | 0.60 | 0.63 | 0.60 | 0.64 | 0.15 | 0.19 |  | 0.53 | 0.55 | 0.56 | 0.59 | 0.53 | 0.52 | 0.14 | 0.13 |  | 0.38 | 0.43 | 0.50 | 0.54 | -0.64 | -0.62 | -0.03 | -0.05 |
| **225** | 0.41 | 0.45 | 0.49 | 0.49 | 0.70 | 0.74 | 0.14 | 0.19 |  | 0.41 | 0.45 | 0.47 | 0.52 | 0.50 | 0.47 | 0.14 | 0.15 |  | 0.23 | 0.29 | 0.41 | 0.47 | -0.56 | -0.56 | -0.07 | -0.09 |
| **241** | 0.21 | 0.25 | 0.22 | 0.24 | 0.62 | 0.63 | 0.14 | 0.19 |  | 0.21 | 0.25 | 0.20 | 0.27 | 0.61 | 0.61 | 0.10 | 0.12 |  | -0.02 | -0.06 | 0.11 | 0.21 | -0.56 | -0.60 | -0.07 | -0.09 |
| **257** | -0.01 | -0.01 | 0.07 | 0.08 | 0.59 | 0.66 | 0.04 | 0.05 |  | -0.01 | -0.01 | 0.05 | 0.04 | 0.49 | 0.50 | -0.04 | -0.07 |  | -0.15 | -0.15 | -0.03 | -0.02 | -0.58 | -0.68 | -0.16 | -0.18 |

**Table B.3.** Correlation time series between GCI and wheat yield per country and mask type

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **District borders** | | | | | | | |  | **Croplands** | | | | | | | |  | **Wheatlands** | | | | | | | |
|  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |
| **Day of year** | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |  | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |  | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |
| **33** | 0.20 | 0.25 | -0.07 | -0.06 | -0.02 | 0.01 | 0.21 | 0.23 |  | 0.20 | 0.25 | -0.07 | -0.06 | 0.04 | 0.02 | 0.23 | 0.29 |  | 0.20 | 0.20 | -0.03 | -0.05 | 0.07 | 0.02 | 0.23 | 0.29 |
| **41** | 0.16 | 0.15 | -0.12 | -0.10 | 0.05 | 0.10 | 0.13 | 0.09 |  | 0.16 | 0.15 | -0.18 | -0.18 | 0.19 | 0.19 | 0.12 | 0.10 |  | 0.19 | 0.20 | -0.15 | -0.13 | 0.27 | 0.19 | 0.16 | 0.15 |
| **49** | 0.08 | 0.09 | -0.05 | -0.02 | 0.44 | 0.52 | 0.21 | 0.27 |  | 0.08 | 0.09 | -0.02 | 0.00 | 0.51 | 0.54 | 0.19 | 0.24 |  | 0.11 | 0.13 | -0.06 | -0.03 | 0.52 | 0.50 | 0.19 | 0.23 |
| **57** | 0.12 | 0.14 | -0.11 | -0.09 | 0.55 | 0.62 | 0.25 | 0.35 |  | 0.11 | 0.16 | -0.09 | -0.10 | 0.61 | 0.65 | 0.25 | 0.34 |  | 0.13 | 0.17 | -0.11 | -0.07 | 0.68 | 0.67 | 0.28 | 0.37 |
| **65** | 0.09 | 0.09 | -0.14 | -0.12 | 0.32 | 0.40 | 0.23 | 0.24 |  | 0.09 | 0.09 | -0.14 | -0.13 | 0.45 | 0.54 | 0.21 | 0.24 |  | 0.11 | 0.11 | -0.16 | -0.14 | 0.52 | 0.55 | 0.21 | 0.23 |
| **73** | 0.15 | 0.14 | -0.10 | -0.10 | 0.28 | 0.36 | 0.17 | 0.19 |  | 0.15 | 0.14 | -0.14 | -0.14 | 0.40 | 0.49 | 0.18 | 0.27 |  | 0.18 | 0.21 | -0.17 | -0.19 | 0.43 | 0.46 | 0.25 | 0.30 |
| **81** | 0.20 | 0.19 | -0.05 | -0.08 | 0.34 | 0.38 | 0.26 | 0.29 |  | 0.20 | 0.19 | -0.11 | -0.13 | 0.51 | 0.56 | 0.24 | 0.31 |  | 0.14 | 0.20 | -0.09 | -0.08 | 0.30 | 0.26 | 0.27 | 0.32 |
| **89** | 0.06 | 0.11 | -0.15 | -0.15 | 0.32 | 0.42 | 0.27 | 0.32 |  | 0.06 | 0.11 | -0.18 | -0.19 | 0.54 | 0.58 | 0.27 | 0.36 |  | 0.01 | 0.05 | -0.11 | -0.11 | 0.43 | 0.46 | 0.32 | 0.39 |
| **97** | 0.20 | 0.21 | -0.03 | -0.03 | 0.25 | 0.27 | 0.24 | 0.26 |  | 0.20 | 0.21 | -0.08 | -0.06 | 0.40 | 0.44 | 0.21 | 0.23 |  | 0.09 | 0.08 | 0.00 | 0.00 | 0.30 | 0.35 | 0.25 | 0.28 |
| **105** | 0.13 | 0.17 | -0.12 | -0.13 | 0.10 | 0.13 | 0.26 | 0.27 |  | 0.13 | 0.17 | -0.13 | -0.12 | 0.40 | 0.40 | 0.28 | 0.26 |  | 0.07 | 0.03 | -0.08 | -0.09 | 0.06 | 0.01 | 0.30 | 0.35 |
| **113** | 0.14 | 0.15 | -0.05 | -0.03 | 0.35 | 0.41 | 0.20 | 0.29 |  | 0.14 | 0.15 | -0.01 | -0.02 | 0.64 | 0.69 | 0.20 | 0.23 |  | 0.09 | 0.11 | -0.04 | -0.04 | 0.57 | 0.61 | 0.19 | 0.24 |
| **121** | 0.11 | 0.09 | 0.01 | 0.03 | 0.38 | 0.47 | 0.23 | 0.23 |  | 0.11 | 0.09 | -0.01 | 0.02 | 0.63 | 0.65 | 0.22 | 0.17 |  | 0.01 | 0.01 | 0.02 | 0.01 | 0.62 | 0.68 | 0.23 | 0.27 |
| **129** | 0.18 | 0.20 | -0.01 | -0.03 | 0.38 | 0.45 | 0.24 | 0.22 |  | 0.18 | 0.20 | -0.05 | -0.06 | 0.69 | 0.71 | 0.26 | 0.20 |  | 0.14 | 0.13 | -0.04 | 0.00 | 0.62 | 0.69 | 0.18 | 0.18 |
| **137** | 0.14 | 0.11 | 0.11 | 0.12 | 0.61 | 0.64 | 0.12 | 0.20 |  | 0.14 | 0.11 | 0.04 | 0.04 | 0.74 | 0.76 | 0.08 | 0.12 |  | 0.10 | 0.10 | 0.04 | 0.01 | 0.65 | 0.76 | 0.01 | 0.02 |
| **145** | 0.05 | 0.04 | 0.16 | 0.18 | 0.52 | 0.59 | 0.10 | 0.12 |  | 0.05 | 0.04 | 0.07 | 0.04 | 0.77 | 0.77 | 0.03 | 0.05 |  | -0.01 | -0.03 | 0.04 | 0.05 | 0.39 | 0.50 | -0.04 | -0.05 |
| **153** | 0.12 | 0.11 | 0.35 | 0.37 | 0.49 | 0.56 | 0.08 | 0.16 |  | 0.12 | 0.11 | 0.21 | 0.26 | 0.69 | 0.69 | 0.03 | 0.02 |  | 0.04 | 0.06 | 0.17 | 0.15 | 0.19 | 0.34 | -0.03 | 0.00 |
| **161** | 0.24 | 0.26 | 0.39 | 0.38 | 0.52 | 0.61 | 0.11 | 0.14 |  | 0.24 | 0.26 | 0.20 | 0.23 | 0.73 | 0.75 | 0.04 | 0.08 |  | 0.16 | 0.17 | 0.23 | 0.22 | 0.30 | 0.33 | -0.01 | -0.02 |
| **169** | 0.23 | 0.30 | 0.08 | 0.06 | 0.49 | 0.58 | 0.14 | 0.19 |  | 0.23 | 0.30 | -0.02 | -0.02 | 0.75 | 0.76 | 0.13 | 0.25 |  | 0.30 | 0.32 | -0.10 | -0.07 | 0.13 | 0.09 | 0.03 | 0.05 |
| **177** | 0.49 | 0.53 | 0.51 | 0.55 | 0.48 | 0.53 | 0.10 | 0.17 |  | 0.49 | 0.53 | 0.34 | 0.38 | 0.79 | 0.77 | 0.05 | 0.03 |  | 0.43 | 0.45 | 0.32 | 0.35 | 0.08 | 0.11 | -0.01 | -0.02 |
| **185** | 0.51 | 0.58 | 0.47 | 0.52 | 0.55 | 0.57 | 0.15 | 0.19 |  | 0.51 | 0.58 | 0.28 | 0.35 | 0.68 | 0.67 | 0.15 | 0.18 |  | 0.49 | 0.54 | 0.26 | 0.29 | -0.05 | -0.05 | 0.06 | 0.02 |
| **193** | 0.52 | 0.58 | 0.58 | 0.61 | 0.55 | 0.63 | 0.13 | 0.19 |  | 0.52 | 0.58 | 0.39 | 0.42 | 0.65 | 0.64 | 0.08 | 0.12 |  | 0.53 | 0.53 | 0.42 | 0.43 | -0.21 | -0.12 | -0.01 | -0.01 |
| **201** | 0.56 | 0.62 | 0.61 | 0.64 | 0.63 | 0.64 | 0.13 | 0.24 |  | 0.56 | 0.62 | 0.45 | 0.50 | 0.59 | 0.56 | 0.10 | 0.12 |  | 0.54 | 0.57 | 0.47 | 0.48 | -0.34 | -0.31 | 0.00 | 0.00 |
| **209** | 0.55 | 0.59 | 0.58 | 0.61 | 0.49 | 0.50 | 0.19 | 0.26 |  | 0.55 | 0.59 | 0.43 | 0.45 | 0.52 | 0.48 | 0.18 | 0.26 |  | 0.47 | 0.52 | 0.46 | 0.47 | -0.30 | -0.30 | 0.05 | 0.03 |
| **217** | 0.49 | 0.54 | 0.61 | 0.63 | 0.64 | 0.67 | 0.18 | 0.26 |  | 0.49 | 0.54 | 0.46 | 0.51 | 0.52 | 0.50 | 0.18 | 0.25 |  | 0.44 | 0.51 | 0.50 | 0.49 | -0.36 | -0.31 | 0.06 | 0.06 |
| **225** | 0.41 | 0.45 | 0.52 | 0.55 | 0.64 | 0.63 | 0.17 | 0.22 |  | 0.41 | 0.45 | 0.40 | 0.42 | 0.55 | 0.54 | 0.15 | 0.21 |  | 0.35 | 0.44 | 0.44 | 0.46 | -0.16 | -0.07 | 0.01 | 0.02 |
| **233** | 0.38 | 0.37 | 0.27 | 0.25 | 0.67 | 0.70 | 0.19 | 0.22 |  | 0.38 | 0.37 | 0.17 | 0.13 | 0.61 | 0.60 | 0.19 | 0.21 |  | 0.21 | 0.24 | 0.21 | 0.20 | -0.18 | -0.04 | 0.04 | 0.00 |
| **241** | 0.27 | 0.31 | 0.27 | 0.29 | 0.57 | 0.55 | 0.18 | 0.21 |  | 0.27 | 0.31 | 0.18 | 0.18 | 0.71 | 0.69 | 0.12 | 0.13 |  | 0.02 | 0.09 | 0.18 | 0.18 | -0.27 | -0.23 | -0.02 | -0.07 |

**Table B.4.** Correlation time series between Lai and wheat yield per country and mask type

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **District borders** | | | | | | | |  | **Croplands** | | | | | | | |  | **Wheatlands** | | | | | | | |
|  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |  | **MON** | | **KAZ** | | **KGZ** | | **UZB** | |
| **Day of year** | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |  | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |  | **mean** | **median** | **mean** | **median** | **mean** | **median** | **mean** | **median** |
| **41** | 0.12 | 0.11 | -0.27 | -0.27 | -0.02 | -0.02 | 0.00 | -0.01 |  | 0.12 | 0.11 | -0.16 | -0.24 | 0.18 | 0.15 | -0.01 | -0.03 |  | 0.13 | 0.17 | -0.31 | -0.31 | 0.31 | 0.24 | 0.01 | -0.03 |
| **45** | 0.21 | 0.20 | -0.05 | -0.05 | 0.12 | 0.12 | 0.14 | 0.15 |  | 0.21 | 0.20 | -0.04 | -0.07 | 0.33 | 0.37 | 0.07 | 0.13 |  | 0.24 | 0.25 | -0.18 | -0.24 | 0.40 | 0.34 | 0.13 | 0.14 |
| **49** | 0.18 | 0.19 | -0.10 | -0.10 | 0.24 | 0.24 | 0.18 | 0.21 |  | 0.18 | 0.19 | -0.07 | -0.12 | 0.28 | 0.31 | 0.19 | 0.21 |  | 0.19 | 0.19 | -0.25 | -0.24 | 0.39 | 0.43 | 0.16 | 0.16 |
| **53** | 0.10 | 0.09 | -0.15 | -0.15 | 0.12 | 0.12 | -0.04 | 0.01 |  | 0.10 | 0.09 | -0.14 | -0.22 | 0.30 | 0.36 | -0.14 | -0.15 |  | 0.19 | 0.22 | -0.30 | -0.32 | 0.38 | 0.39 | -0.01 | 0.04 |
| **57** | 0.22 | 0.28 | -0.12 | -0.12 | 0.60 | 0.60 | 0.20 | 0.24 |  | 0.22 | 0.28 | -0.11 | -0.12 | 0.70 | 0.71 | 0.21 | 0.27 |  | 0.22 | 0.24 | -0.30 | -0.28 | 0.75 | 0.72 | 0.18 | 0.19 |
| **61** | 0.19 | 0.19 | -0.17 | -0.17 | 0.36 | 0.36 | 0.28 | 0.33 |  | 0.19 | 0.19 | -0.13 | -0.10 | 0.54 | 0.61 | 0.29 | 0.39 |  | 0.21 | 0.22 | -0.24 | -0.23 | 0.61 | 0.63 | 0.34 | 0.38 |
| **65** | 0.21 | 0.26 | -0.13 | -0.13 | 0.40 | 0.40 | 0.27 | 0.26 |  | 0.21 | 0.26 | -0.17 | -0.20 | 0.51 | 0.59 | 0.26 | 0.32 |  | 0.22 | 0.22 | -0.19 | -0.20 | 0.59 | 0.61 | 0.28 | 0.29 |
| **69** | 0.25 | 0.28 | -0.14 | -0.14 | 0.35 | 0.35 | 0.22 | 0.27 |  | 0.25 | 0.28 | -0.10 | -0.13 | 0.45 | 0.57 | 0.21 | 0.28 |  | 0.29 | 0.31 | -0.14 | -0.18 | 0.55 | 0.66 | 0.25 | 0.27 |
| **73** | 0.26 | 0.31 | -0.07 | -0.07 | 0.40 | 0.40 | 0.15 | 0.20 |  | 0.26 | 0.31 | -0.06 | -0.05 | 0.48 | 0.55 | 0.11 | 0.17 |  | 0.33 | 0.33 | -0.11 | -0.14 | 0.55 | 0.58 | 0.17 | 0.21 |
| **77** | 0.21 | 0.21 | 0.04 | 0.04 | 0.32 | 0.32 | 0.21 | 0.26 |  | 0.21 | 0.21 | 0.06 | 0.09 | 0.36 | 0.42 | 0.19 | 0.26 |  | 0.27 | 0.28 | 0.00 | 0.01 | 0.45 | 0.47 | 0.23 | 0.29 |
| **81** | 0.22 | 0.26 | -0.07 | -0.07 | 0.22 | 0.22 | 0.10 | 0.12 |  | 0.22 | 0.26 | -0.06 | -0.06 | 0.31 | 0.33 | 0.07 | 0.09 |  | 0.20 | 0.19 | -0.07 | -0.09 | 0.32 | 0.34 | 0.15 | 0.12 |
| **85** | 0.10 | 0.09 | -0.04 | -0.04 | 0.48 | 0.48 | 0.14 | 0.14 |  | 0.10 | 0.09 | -0.03 | 0.00 | 0.54 | 0.59 | 0.16 | 0.19 |  | 0.07 | 0.12 | -0.04 | -0.04 | 0.58 | 0.57 | 0.16 | 0.18 |
| **89** | 0.03 | 0.07 | -0.09 | -0.09 | 0.33 | 0.33 | -0.03 | -0.04 |  | 0.03 | 0.07 | -0.08 | -0.04 | 0.43 | 0.42 | -0.03 | -0.03 |  | 0.04 | 0.08 | -0.09 | -0.08 | 0.32 | 0.31 | -0.04 | -0.02 |
| **93** | 0.22 | 0.24 | -0.23 | -0.23 | 0.38 | 0.38 | 0.25 | 0.26 |  | 0.22 | 0.24 | -0.22 | -0.20 | 0.49 | 0.51 | 0.23 | 0.27 |  | 0.21 | 0.21 | -0.23 | -0.21 | 0.48 | 0.42 | 0.29 | 0.29 |
| **97** | 0.13 | 0.13 | -0.14 | -0.14 | 0.44 | 0.44 | 0.21 | 0.23 |  | 0.13 | 0.13 | -0.07 | -0.09 | 0.45 | 0.50 | 0.20 | 0.22 |  | 0.02 | 0.02 | -0.13 | -0.14 | 0.35 | 0.32 | 0.23 | 0.21 |
| **101** | 0.13 | 0.14 | -0.08 | -0.08 | 0.24 | 0.24 | 0.31 | 0.32 |  | 0.13 | 0.14 | -0.01 | 0.00 | 0.30 | 0.30 | 0.29 | 0.27 |  | 0.01 | -0.03 | -0.06 | -0.07 | 0.26 | 0.27 | 0.34 | 0.31 |
| **105** | -0.10 | -0.13 | -0.15 | -0.15 | 0.04 | 0.04 | 0.18 | 0.19 |  | -0.10 | -0.13 | -0.12 | -0.11 | 0.07 | 0.07 | 0.23 | 0.22 |  | -0.16 | -0.25 | -0.14 | -0.12 | -0.06 | -0.10 | 0.20 | 0.23 |
| **109** | 0.19 | 0.22 | -0.28 | -0.28 | 0.14 | 0.14 | 0.34 | 0.37 |  | 0.19 | 0.22 | -0.24 | -0.27 | 0.26 | 0.25 | 0.34 | 0.36 |  | 0.16 | 0.12 | -0.25 | -0.27 | 0.08 | 0.09 | 0.36 | 0.40 |
| **113** | -0.02 | -0.03 | -0.20 | -0.20 | 0.28 | 0.28 | 0.21 | 0.22 |  | -0.02 | -0.03 | -0.19 | -0.18 | 0.40 | 0.41 | 0.25 | 0.23 |  | -0.08 | -0.14 | -0.16 | -0.13 | 0.33 | 0.34 | 0.19 | 0.17 |
| **117** | -0.04 | -0.07 | -0.03 | -0.03 | 0.64 | 0.64 | 0.16 | 0.19 |  | -0.04 | -0.07 | -0.03 | 0.01 | 0.75 | 0.82 | 0.16 | 0.16 |  | -0.08 | -0.14 | 0.00 | 0.00 | 0.76 | 0.85 | 0.14 | 0.14 |
| **121** | 0.31 | 0.31 | 0.07 | 0.07 | 0.05 | 0.05 | 0.16 | 0.24 |  | 0.31 | 0.31 | 0.04 | 0.02 | 0.16 | 0.16 | 0.18 | 0.22 |  | 0.30 | 0.34 | 0.12 | 0.15 | 0.06 | 0.08 | 0.14 | 0.13 |
| **125** | -0.02 | -0.02 | 0.09 | 0.09 | 0.46 | 0.46 | 0.12 | 0.11 |  | -0.02 | -0.02 | 0.04 | 0.08 | 0.61 | 0.67 | 0.11 | 0.05 |  | -0.09 | -0.07 | 0.09 | 0.10 | 0.66 | 0.79 | 0.02 | 0.01 |
| **129** | 0.19 | 0.23 | 0.00 | 0.00 | 0.26 | 0.26 | 0.05 | 0.04 |  | 0.19 | 0.23 | -0.05 | -0.09 | 0.53 | 0.55 | 0.06 | 0.07 |  | 0.17 | 0.17 | -0.01 | -0.05 | 0.49 | 0.54 | -0.03 | -0.09 |
| **133** | 0.20 | 0.22 | 0.00 | 0.00 | 0.41 | 0.41 | 0.20 | 0.17 |  | 0.20 | 0.22 | -0.10 | -0.15 | 0.57 | 0.65 | 0.26 | 0.23 |  | 0.24 | 0.27 | -0.04 | -0.04 | 0.54 | 0.58 | 0.17 | 0.20 |
| **137** | 0.17 | 0.18 | 0.07 | 0.07 | 0.59 | 0.59 | 0.19 | 0.26 |  | 0.17 | 0.18 | -0.01 | -0.01 | 0.72 | 0.73 | 0.17 | 0.18 |  | 0.19 | 0.15 | 0.04 | 0.03 | 0.65 | 0.65 | 0.04 | 0.07 |
| **141** | 0.08 | 0.06 | 0.04 | 0.04 | 0.55 | 0.55 | 0.12 | 0.18 |  | 0.08 | 0.06 | -0.08 | -0.08 | 0.63 | 0.67 | 0.10 | 0.11 |  | 0.12 | 0.12 | 0.00 | -0.04 | 0.54 | 0.60 | -0.04 | 0.02 |
| **145** | 0.09 | 0.09 | 0.16 | 0.16 | 0.67 | 0.67 | 0.14 | 0.20 |  | 0.09 | 0.09 | 0.02 | 0.05 | 0.77 | 0.80 | 0.11 | 0.05 |  | 0.12 | 0.17 | 0.10 | 0.11 | 0.64 | 0.74 | -0.02 | 0.01 |
| **149** | 0.14 | 0.13 | 0.13 | 0.13 | 0.69 | 0.69 | 0.15 | 0.11 |  | 0.14 | 0.13 | -0.01 | 0.05 | 0.83 | 0.82 | 0.11 | 0.07 |  | 0.16 | 0.12 | 0.05 | 0.05 | 0.66 | 0.77 | 0.02 | 0.04 |
| **153** | 0.18 | 0.18 | 0.25 | 0.25 | 0.48 | 0.48 | 0.02 | 0.03 |  | 0.18 | 0.18 | 0.09 | 0.12 | 0.74 | 0.79 | -0.06 | -0.06 |  | 0.22 | 0.21 | 0.13 | 0.16 | 0.50 | 0.62 | -0.10 | -0.11 |
| **157** | 0.14 | 0.12 | 0.44 | 0.44 | 0.64 | 0.64 | 0.09 | 0.12 |  | 0.14 | 0.12 | 0.27 | 0.35 | 0.79 | 0.81 | 0.02 | 0.04 |  | 0.15 | 0.12 | 0.31 | 0.33 | 0.55 | 0.61 | -0.05 | -0.06 |
| **161** | 0.23 | 0.22 | 0.46 | 0.46 | 0.34 | 0.34 | 0.05 | 0.03 |  | 0.23 | 0.22 | 0.28 | 0.29 | 0.63 | 0.63 | 0.00 | 0.01 |  | 0.20 | 0.16 | 0.34 | 0.35 | 0.24 | 0.25 | -0.07 | -0.09 |
| **165** | 0.16 | 0.20 | 0.50 | 0.50 | 0.50 | 0.50 | 0.12 | 0.16 |  | 0.16 | 0.20 | 0.33 | 0.36 | 0.71 | 0.72 | 0.15 | 0.13 |  | 0.19 | 0.22 | 0.35 | 0.34 | 0.45 | 0.50 | 0.05 | 0.00 |
| **169** | 0.07 | 0.13 | 0.26 | 0.26 | 0.51 | 0.51 | 0.13 | 0.17 |  | 0.07 | 0.13 | 0.13 | 0.14 | 0.70 | 0.70 | 0.13 | 0.15 |  | 0.16 | 0.22 | 0.13 | 0.11 | 0.17 | 0.15 | -0.02 | 0.01 |
| **173** | 0.09 | 0.11 | 0.12 | 0.12 | 0.35 | 0.35 | 0.08 | 0.14 |  | 0.09 | 0.11 | -0.03 | -0.09 | 0.56 | 0.57 | 0.01 | 0.02 |  | 0.22 | 0.22 | -0.04 | -0.06 | 0.12 | 0.08 | -0.10 | -0.09 |
| **177** | 0.40 | 0.46 | 0.51 | 0.51 | 0.48 | 0.48 | 0.09 | 0.12 |  | 0.40 | 0.46 | 0.42 | 0.44 | 0.69 | 0.67 | 0.09 | 0.18 |  | 0.49 | 0.50 | 0.38 | 0.45 | 0.09 | 0.06 | -0.07 | -0.06 |
| **181** | 0.53 | 0.56 | 0.45 | 0.45 | 0.41 | 0.41 | 0.13 | 0.22 |  | 0.53 | 0.56 | 0.39 | 0.45 | 0.65 | 0.65 | 0.07 | 0.02 |  | 0.52 | 0.53 | 0.32 | 0.36 | -0.12 | -0.10 | -0.04 | -0.05 |
| **185** | 0.36 | 0.44 | 0.53 | 0.53 | 0.54 | 0.54 | 0.15 | 0.25 |  | 0.36 | 0.44 | 0.47 | 0.49 | 0.65 | 0.67 | 0.11 | 0.17 |  | 0.41 | 0.44 | 0.40 | 0.47 | 0.08 | 0.05 | 0.01 | -0.05 |
| **189** | 0.44 | 0.57 | 0.45 | 0.45 | 0.52 | 0.52 | 0.13 | 0.23 |  | 0.44 | 0.57 | 0.41 | 0.44 | 0.60 | 0.58 | 0.04 | 0.13 |  | 0.53 | 0.59 | 0.34 | 0.36 | 0.11 | 0.13 | -0.07 | -0.08 |
| **193** | 0.60 | 0.68 | 0.49 | 0.49 | 0.54 | 0.54 | 0.14 | 0.15 |  | 0.60 | 0.68 | 0.46 | 0.50 | 0.58 | 0.56 | 0.15 | 0.20 |  | 0.60 | 0.64 | 0.39 | 0.45 | -0.22 | -0.14 | 0.03 | 0.02 |
| **197** | 0.37 | 0.47 | 0.65 | 0.65 | 0.35 | 0.35 | 0.15 | 0.21 |  | 0.37 | 0.47 | 0.61 | 0.68 | 0.42 | 0.39 | 0.06 | 0.04 |  | 0.40 | 0.44 | 0.53 | 0.62 | -0.16 | -0.15 | -0.04 | -0.09 |
| **201** | 0.49 | 0.61 | 0.66 | 0.66 | 0.41 | 0.41 | 0.13 | 0.24 |  | 0.49 | 0.61 | 0.62 | 0.65 | 0.45 | 0.45 | 0.13 | 0.15 |  | 0.54 | 0.58 | 0.53 | 0.56 | -0.16 | -0.14 | 0.00 | 0.01 |
| **205** | 0.52 | 0.58 | 0.61 | 0.61 | 0.68 | 0.68 | 0.08 | 0.15 |  | 0.52 | 0.58 | 0.55 | 0.61 | 0.54 | 0.54 | -0.02 | 0.03 |  | 0.54 | 0.56 | 0.52 | 0.53 | -0.12 | -0.09 | -0.14 | -0.13 |
| **209** | 0.62 | 0.64 | 0.63 | 0.63 | 0.44 | 0.44 | 0.16 | 0.21 |  | 0.62 | 0.66 | 0.56 | 0.61 | 0.45 | 0.45 | 0.15 | 0.25 |  | 0.58 | 0.64 | 0.55 | 0.58 | -0.32 | -0.32 | -0.03 | -0.05 |
| **213** | 0.35 | 0.39 | 0.60 | 0.60 | 0.32 | 0.32 | 0.25 | 0.33 |  | 0.35 | 0.39 | 0.58 | 0.64 | 0.37 | 0.37 | 0.13 | 0.21 |  | 0.37 | 0.41 | 0.53 | 0.59 | -0.18 | -0.17 | 0.04 | 0.03 |
| **217** | 0.35 | 0.43 | 0.60 | 0.60 | 0.58 | 0.58 | 0.20 | 0.31 |  | 0.35 | 0.43 | 0.53 | 0.58 | 0.49 | 0.43 | 0.17 | 0.22 |  | 0.37 | 0.43 | 0.51 | 0.51 | -0.14 | -0.08 | 0.03 | 0.09 |
| **221** | 0.48 | 0.54 | 0.56 | 0.56 | 0.50 | 0.50 | 0.16 | 0.20 |  | 0.48 | 0.54 | 0.50 | 0.52 | 0.46 | 0.45 | 0.07 | 0.05 |  | 0.43 | 0.49 | 0.47 | 0.48 | -0.10 | -0.05 | -0.06 | -0.09 |
| **225** | 0.43 | 0.46 | 0.52 | 0.52 | 0.74 | 0.74 | 0.19 | 0.24 |  | 0.43 | 0.46 | 0.53 | 0.56 | 0.65 | 0.61 | 0.17 | 0.25 |  | 0.42 | 0.41 | 0.45 | 0.47 | -0.09 | -0.03 | 0.02 | 0.02 |
| **229** | 0.38 | 0.36 | 0.38 | 0.38 | 0.60 | 0.60 | 0.23 | 0.29 |  | 0.38 | 0.36 | 0.36 | 0.37 | 0.46 | 0.41 | 0.20 | 0.22 |  | 0.28 | 0.30 | 0.31 | 0.33 | -0.23 | -0.17 | 0.04 | 0.01 |

**Table B.5.** Correlation time series between LST and wheat yield per country and mask type

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | District borders | | | | | | | |  | Croplands | | | | | | | |  | Wheatlands | | | | | | | |
|  | MON | | KAZ | | KGZ | | UZB | |  | MON | | KAZ | | KGZ | | UZB | |  | MON | | KAZ | | KGZ | | UZB | |
| Day of year | mean | median | mean | median | mean | median | mean | median |  | mean | median | mean | median | mean | median | mean | median |  | mean | median | mean | median | mean | median | mean | median |
| 65 | 0.01 | 0.01 | -0.02 | 0.04 | 0.25 | 0.31 | 0.19 | 0.18 |  | 0.19 | 0.23 | 0.00 | 0.03 | 0.37 | 0.44 | 0.19 | 0.16 |  | 0.05 | 0.05 | -0.01 | 0.02 | 0.42 | 0.46 | 0.18 | 0.14 |
| 73 | 0.09 | 0.10 | 0.17 | 0.15 | 0.12 | 0.09 | -0.11 | -0.14 |  | 0.18 | 0.18 | 0.20 | 0.18 | 0.19 | 0.17 | -0.09 | -0.09 |  | 0.14 | 0.15 | 0.17 | 0.19 | 0.22 | 0.17 | -0.09 | -0.11 |
| 81 | 0.13 | 0.15 | 0.02 | 0.04 | 0.17 | 0.20 | -0.16 | -0.20 |  | 0.20 | 0.22 | 0.04 | 0.04 | 0.10 | 0.10 | -0.21 | -0.21 |  | 0.17 | 0.17 | 0.01 | 0.02 | 0.13 | 0.13 | -0.17 | -0.19 |
| 89 | 0.12 | 0.14 | -0.12 | -0.13 | -0.37 | -0.39 | -0.28 | -0.28 |  | 0.26 | 0.30 | -0.11 | -0.14 | -0.41 | -0.44 | -0.30 | -0.34 |  | 0.15 | 0.16 | -0.13 | -0.14 | -0.40 | -0.38 | -0.27 | -0.28 |
| 97 | 0.21 | 0.28 | -0.01 | -0.02 | -0.11 | -0.11 | -0.10 | -0.08 |  | 0.28 | 0.33 | -0.04 | -0.04 | -0.24 | -0.28 | -0.11 | -0.15 |  | 0.23 | 0.25 | 0.00 | -0.01 | -0.24 | -0.27 | -0.11 | -0.13 |
| 105 | 0.20 | 0.23 | -0.13 | -0.14 | -0.35 | -0.36 | -0.05 | -0.05 |  | 0.09 | 0.15 | -0.10 | -0.14 | -0.40 | -0.41 | -0.08 | -0.08 |  | 0.22 | 0.21 | -0.09 | -0.11 | -0.40 | -0.41 | -0.06 | -0.07 |
| 113 | -0.04 | -0.03 | -0.22 | -0.28 | -0.49 | -0.48 | -0.07 | -0.11 |  | 0.20 | 0.22 | -0.19 | -0.17 | -0.52 | -0.54 | -0.03 | -0.10 |  | 0.01 | 0.03 | -0.16 | -0.16 | -0.52 | -0.51 | -0.05 | -0.11 |
| 121 | 0.13 | 0.14 | 0.02 | 0.01 | -0.61 | -0.58 | -0.11 | -0.13 |  | 0.01 | 0.03 | 0.05 | 0.01 | -0.75 | -0.76 | -0.14 | -0.16 |  | 0.16 | 0.17 | 0.07 | 0.01 | -0.73 | -0.74 | -0.13 | -0.14 |
| 129 | -0.11 | -0.15 | -0.10 | -0.08 | -0.66 | -0.68 | -0.13 | -0.15 |  | -0.24 | -0.26 | -0.07 | -0.06 | -0.66 | -0.67 | -0.10 | -0.15 |  | -0.08 | -0.08 | -0.06 | -0.03 | -0.68 | -0.70 | -0.10 | -0.16 |
| 137 | -0.31 | -0.31 | -0.14 | -0.13 | -0.59 | -0.65 | -0.10 | -0.14 |  | -0.13 | -0.15 | -0.09 | -0.11 | -0.68 | -0.69 | -0.10 | -0.12 |  | -0.28 | -0.31 | -0.10 | -0.09 | -0.64 | -0.64 | -0.03 | -0.10 |
| 145 | -0.16 | -0.21 | -0.23 | -0.24 | -0.68 | -0.74 | 0.00 | -0.05 |  | 0.05 | 0.04 | -0.19 | -0.22 | -0.78 | -0.82 | 0.04 | 0.03 |  | -0.16 | -0.21 | -0.19 | -0.20 | -0.77 | -0.81 | 0.07 | 0.10 |
| 153 | -0.07 | -0.06 | -0.34 | -0.33 | -0.27 | -0.29 | -0.02 | 0.01 |  | -0.16 | -0.19 | -0.27 | -0.29 | -0.47 | -0.43 | 0.03 | 0.11 |  | -0.06 | -0.03 | -0.29 | -0.30 | -0.39 | -0.35 | 0.05 | 0.11 |
| 161 | -0.20 | -0.26 | -0.21 | -0.20 | -0.47 | -0.48 | 0.02 | 0.01 |  | -0.52 | -0.53 | -0.16 | -0.16 | -0.71 | -0.73 | 0.06 | 0.11 |  | -0.15 | -0.22 | -0.14 | -0.15 | -0.64 | -0.66 | 0.08 | 0.09 |
| 169 | -0.52 | -0.53 | -0.39 | -0.44 | -0.54 | -0.53 | -0.17 | -0.21 |  | -0.41 | -0.46 | -0.35 | -0.39 | -0.70 | -0.71 | -0.17 | -0.23 |  | -0.48 | -0.47 | -0.30 | -0.33 | -0.60 | -0.61 | -0.12 | -0.13 |
| 177 | -0.41 | -0.46 | -0.40 | -0.43 | -0.67 | -0.67 | 0.07 | 0.01 |  | -0.50 | -0.51 | -0.41 | -0.44 | -0.67 | -0.66 | 0.08 | 0.06 |  | -0.41 | -0.44 | -0.32 | -0.37 | -0.49 | -0.45 | 0.11 | 0.08 |
| 185 | -0.47 | -0.46 | -0.36 | -0.38 | -0.52 | -0.50 | 0.01 | 0.00 |  | -0.41 | -0.47 | -0.38 | -0.40 | -0.65 | -0.66 | 0.01 | -0.04 |  | -0.42 | -0.42 | -0.28 | -0.30 | -0.40 | -0.41 | 0.03 | -0.03 |
| 193 | -0.39 | -0.45 | -0.44 | -0.45 | -0.43 | -0.42 | 0.00 | -0.04 |  | -0.47 | -0.52 | -0.43 | -0.44 | -0.67 | -0.66 | 0.00 | -0.07 |  | -0.34 | -0.38 | -0.39 | -0.42 | -0.53 | -0.51 | 0.01 | -0.07 |
| 201 | -0.46 | -0.49 | -0.43 | -0.47 | -0.40 | -0.42 | 0.03 | 0.04 |  | -0.36 | -0.38 | -0.44 | -0.49 | -0.52 | -0.51 | 0.03 | 0.02 |  | -0.46 | -0.47 | -0.40 | -0.40 | -0.32 | -0.32 | 0.06 | 0.09 |
| 209 | -0.30 | -0.32 | -0.39 | -0.41 | -0.24 | -0.27 | -0.18 | -0.24 |  | -0.49 | -0.53 | -0.46 | -0.47 | -0.29 | -0.33 | -0.14 | -0.17 |  | -0.28 | -0.29 | -0.35 | -0.38 | -0.14 | -0.19 | -0.08 | -0.10 |
| 217 | -0.46 | -0.50 | -0.43 | -0.44 | -0.58 | -0.62 | 0.04 | 0.08 |  | -0.25 | -0.25 | -0.49 | -0.51 | -0.57 | -0.57 | 0.08 | 0.10 |  | -0.43 | -0.48 | -0.38 | -0.40 | -0.33 | -0.31 | 0.15 | 0.22 |
| 225 | -0.26 | -0.27 | -0.30 | -0.29 | -0.55 | -0.58 | -0.13 | -0.19 |  | -0.27 | -0.29 | -0.36 | -0.35 | -0.60 | -0.64 | -0.09 | -0.12 |  | -0.20 | -0.22 | -0.27 | -0.26 | -0.46 | -0.46 | -0.05 | -0.05 |
| 233 | -0.28 | -0.31 | -0.34 | -0.34 | -0.82 | -0.85 | -0.03 | -0.01 |  | -0.16 | -0.20 | -0.39 | -0.41 | -0.81 | -0.84 | -0.04 | -0.03 |  | -0.21 | -0.23 | -0.32 | -0.30 | -0.70 | -0.70 | 0.06 | 0.12 |
| 241 | -0.13 | -0.14 | -0.11 | -0.07 | -0.70 | -0.71 | -0.02 | -0.02 |  | -0.16 | -0.16 | -0.13 | -0.13 | -0.69 | -0.69 | 0.00 | 0.06 |  | -0.08 | -0.09 | -0.10 | -0.09 | -0.55 | -0.55 | 0.05 | 0.10 |

# Appendix C

Figure C.1. Boxplot of correlation coefficients between rainfed wheat yields in Kazakhstan and mean/max values of satellite vegetation indices for the entire district area, croplands and wheatlands; Note: Statistical significance of Wilcoxon test is indicated by following p-values: *\*p≤0.05, \*\* p≤0.01, \*\*\*p≤0.001*.

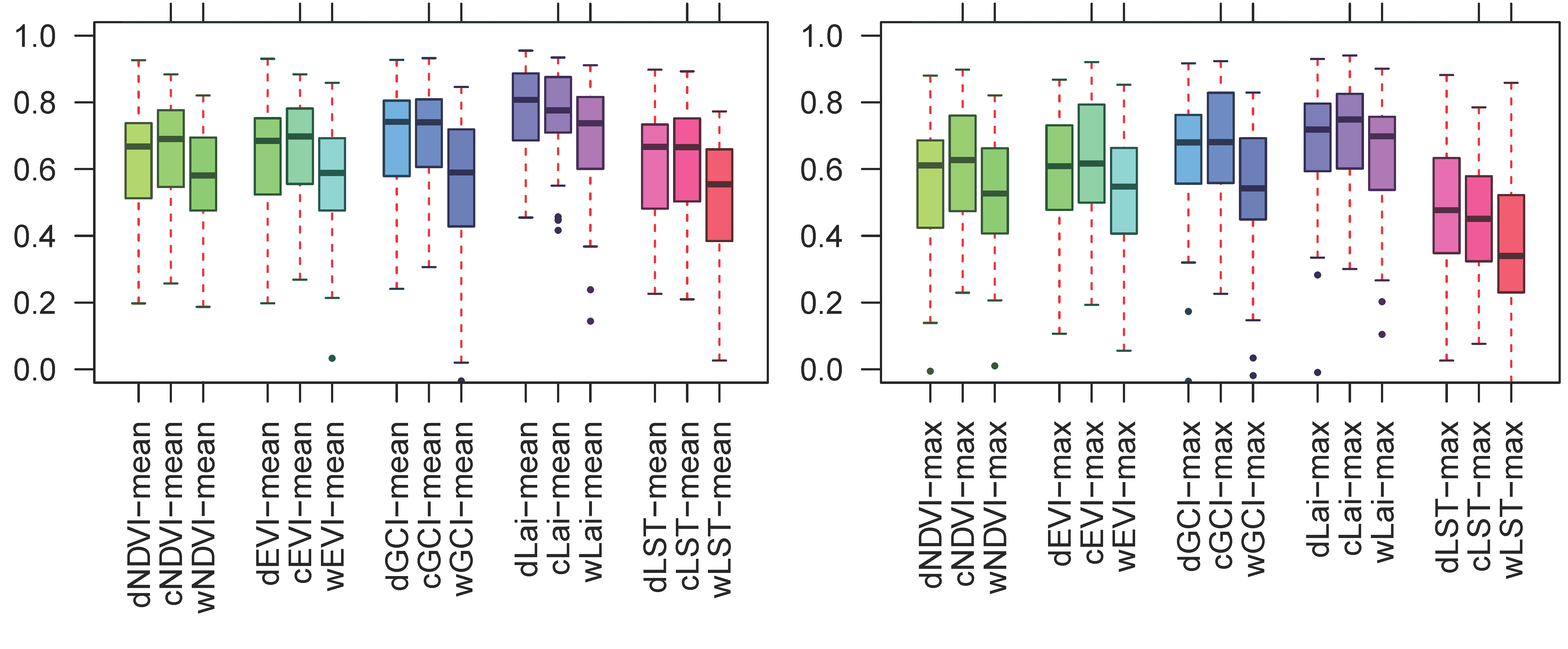


Figure C.2. Boxplot of correlation coefficients between rainfed wheat yields in Mongolia and mean/max values of indices for the entire district area, croplands and wheatlands; Note: Statistical significance of Wilcoxon test is indicated by following p-values: *\*p≤0.05, \*\* p≤0.01, \*\*\*p≤0.001*.

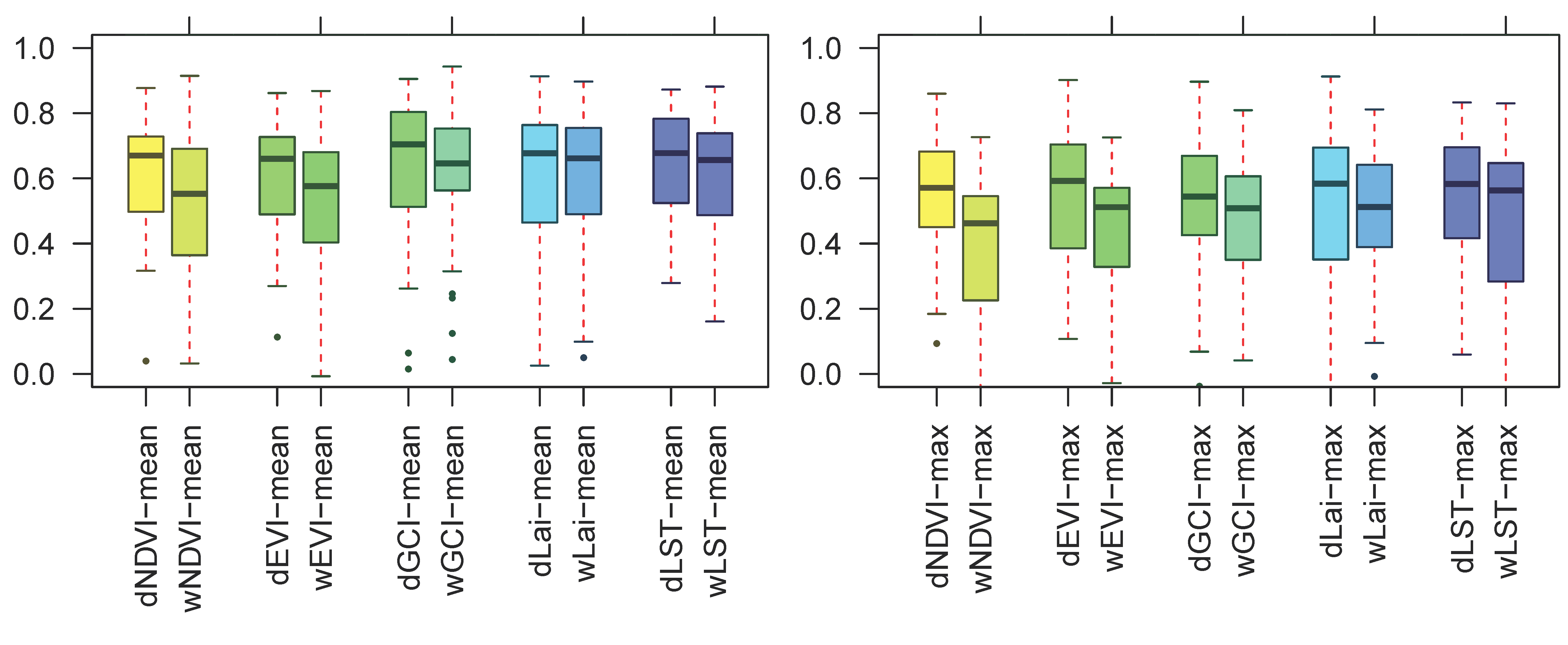


Figure C.3. Boxplot of correlation coefficients between mixed wheat yields in Kyrgyzstan and mean/max values of indices for the entire district area, croplands and wheatlands; Note: Statistical significance of Wilcoxon test is indicated by following p-values: *\*p≤0.05, \*\* p≤0.01, \*\*\*p≤0.001*.

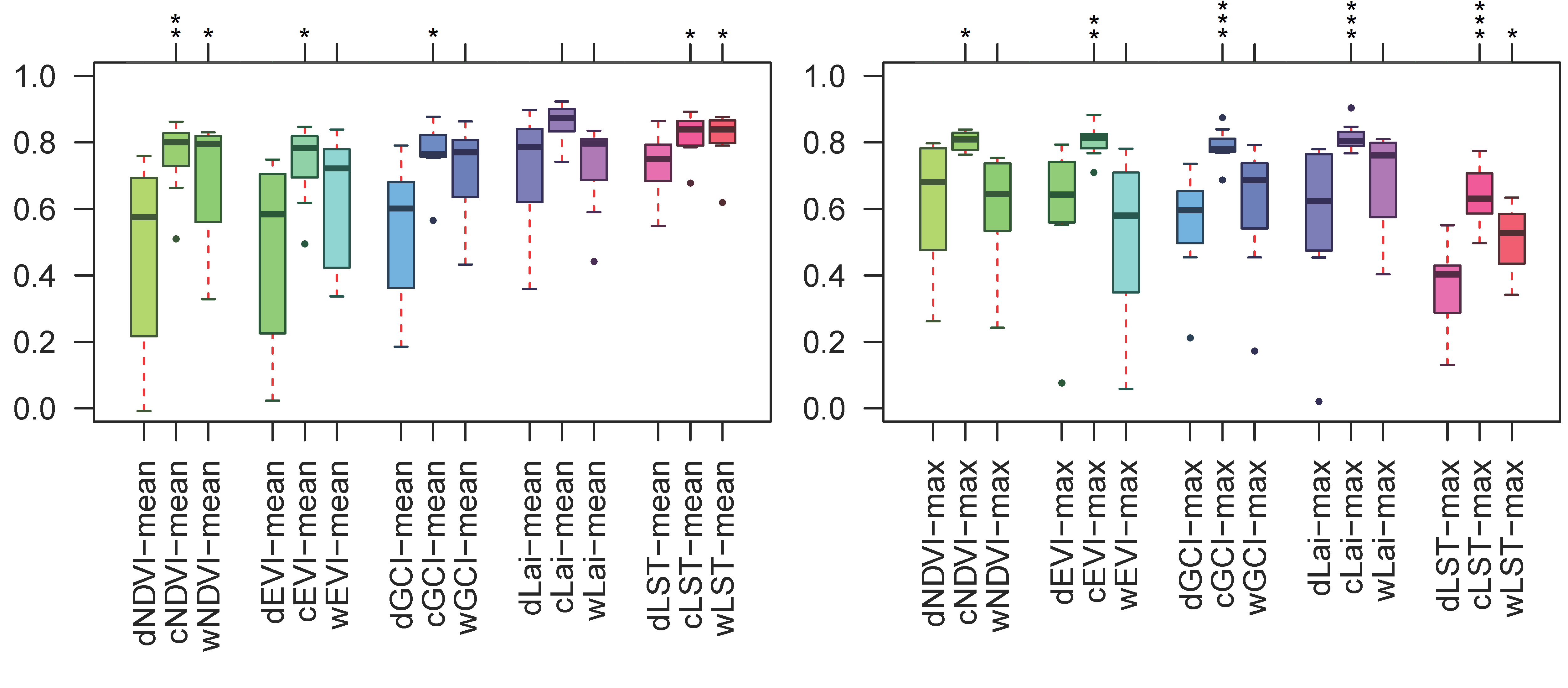


Figure C.4. Boxplot of correlation coefficients between irrigated wheat yields in Uzbekistan and mean/max values of indices for the entire district area, croplands and wheatlands; Note: Statistical significance of Wilcoxon test is indicated by following p-values: *\*p≤0.05, \*\* p≤0.01, \*\*\*p≤0.001*.

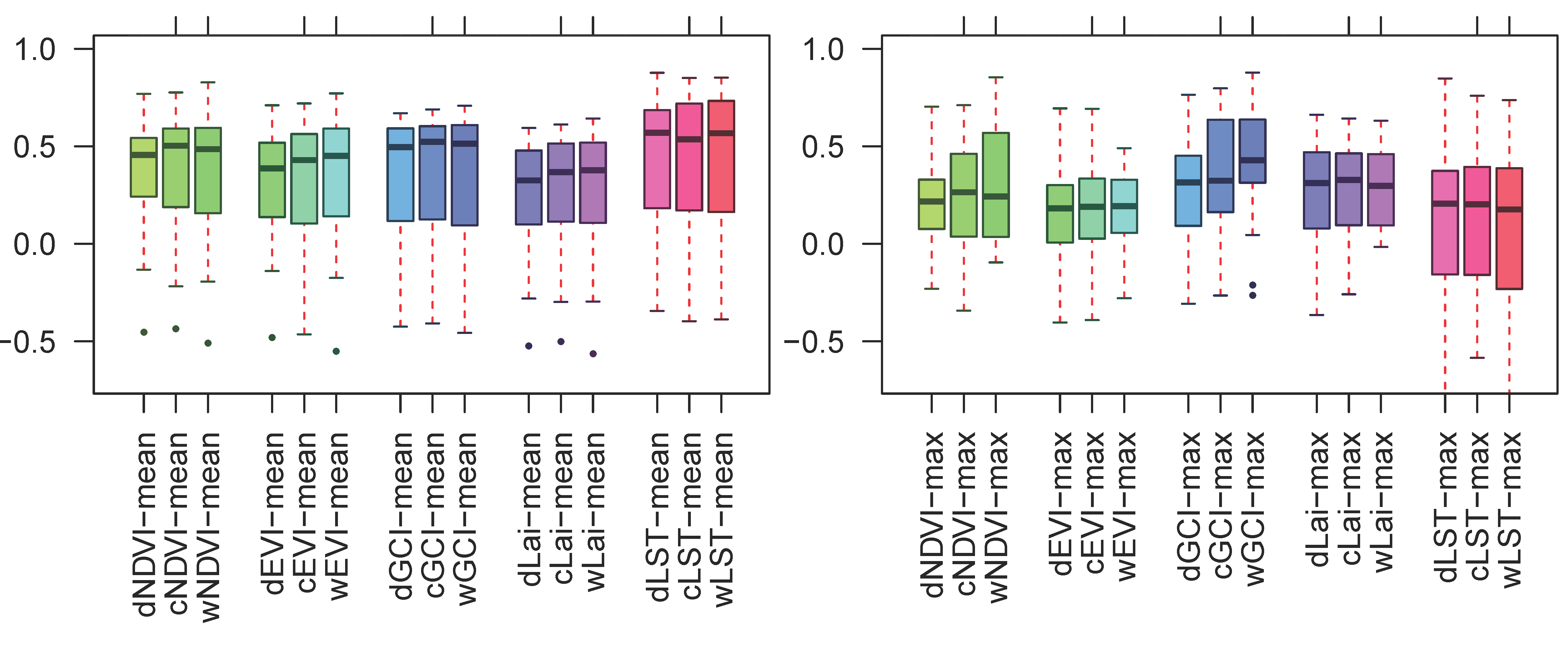


Figure C.5. Boxplot of correlation coefficients between mixed wheat yield in Uzbekistan and mean/max values of indices for entire district area, croplands and wheatlands; Note: Statistical significance of Wilcoxon test is indicated by following p-values: *\*p≤0.05, \*\* p≤0.01, \*\*\*p≤0.001*.

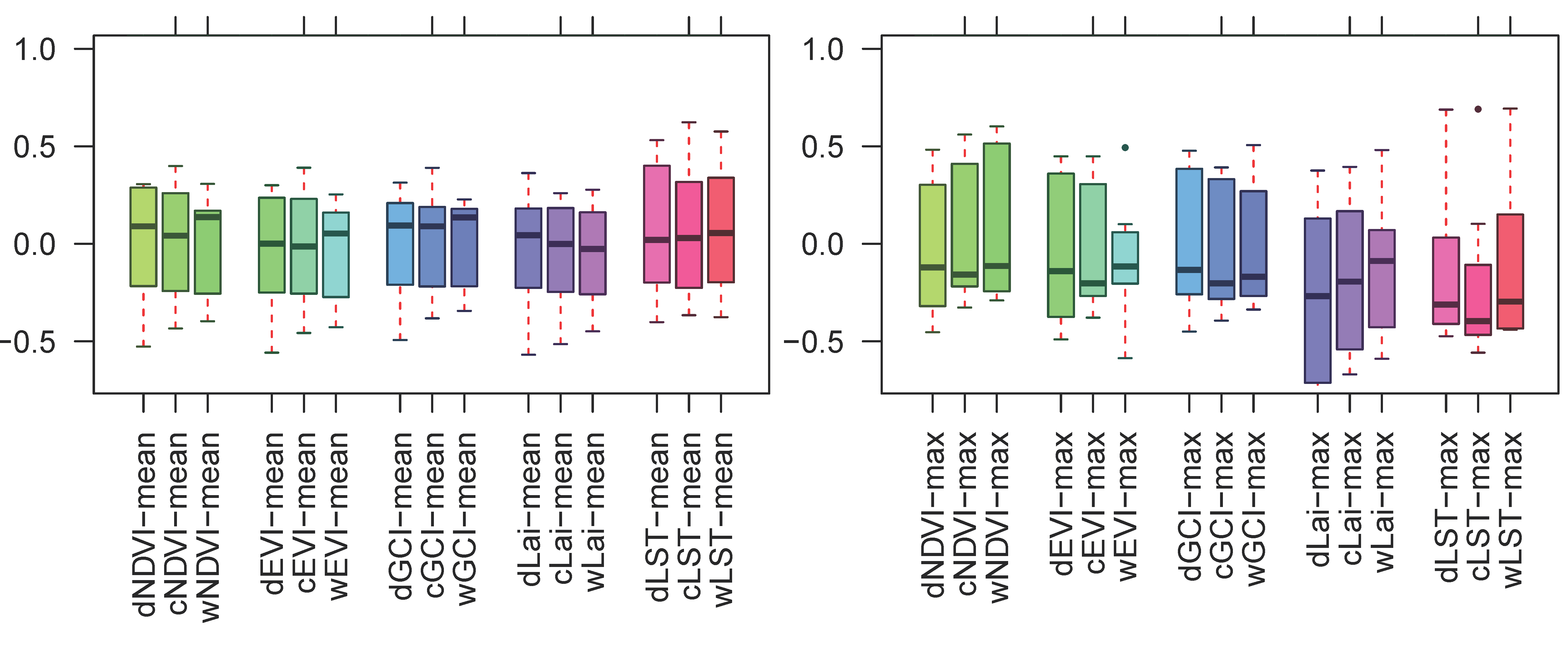


Figure C.6. Boxplot of correlation coefficients between rainfed wheat yield in Uzbekistan and mean/max values of indices for entire district area, croplands and wheatlands; Note: Statistical significance of Wilcoxon test is indicated by following p-values: *\*p≤0.05, \*\* p≤0.01, \*\*\*p≤0.001*.

