

Supplementary Information (SI)

SI Table 1. *p* values from the ANOVA showing the effect of land use on organic carbon (OC), nitrogen (N) and C:N ratios of bulk soils from four agroecological zones (AEZ)

| Parameters | AEZ 7 | AEZ 3 | AEZ 9 | AEZ 5 |
|------------|---------|---------|---------|---------|
| OC | 7.5E-07 | 3.9E-07 | 3.3E-03 | 4.1E-08 |
| N | 8.8E-04 | 2.4E-02 | 7.5E-03 | 3.0E-05 |
| C:N ratio | 2.1E-03 | 3.3E-03 | 2.8E-03 | 4.6E-03 |

SI Table 2. *p* values from the ANOVA showing the effect of agroecological zones on organic carbon (OC), nitrogen (N) and C:N ratios of bulk soils from four land uses

| Parameters | Cropland | Orchard | Grassland | Fallow |
|------------|----------|----------|-----------|----------|
| OC | 1.08E-05 | 5.09E-08 | 4.08E-06 | 3.47E-04 |
| N | 1.01E-03 | 4.78E-05 | 4.00E-05 | 6.66E-04 |
| C:N ratio | 3.54E-02 | 1.49E-03 | 9.56E-03 | 6.20E-02 |

SI Table 3. *p* values from the ANOVA showing the effect of land use on organic carbon (OC), nitrogen (N) and C:N ratios of soil fractions (POM=> 53 μm and MOM = <53 μm) from four agroecological zones (AEZ)

| Parameters | AEZ 7 | | AEZ 3 | | AEZ 9 | | AEZ 5 | |
|------------|---------|---------|---------|---------|---------|---------|----------|----------|
| | POM | MOM | POM | MOM | POM | MOM | POM | MOM |
| OC | 8.6E-15 | 2.9E-10 | 8.6E-15 | 2.9E-10 | 1.3E-09 | 1.1E-06 | 9.36E-14 | 3.50E-05 |
| N | 1.3E-15 | 2.9E-08 | 1.3E-15 | 2.9E-08 | 2.4E-11 | 1.2E-07 | 2.5E-14 | 1.5E-17 |
| C:N ratio | 2.5E-14 | 2.2E-03 | 2.5E-14 | 2.2E-03 | 1.0E-06 | 6.6E-03 | 7.1E-09 | 3.6E-12 |

SI Table 4. *p* values from the ANOVA showing the variation of soil fractions on organic carbon (OC), nitrogen (N) and C:N ratios of soils from four land uses and agroecological zones (AEZ)

| Parameters | AEZ 7 | | | | AEZ 3 | | | |
|------------|----------|---------|-----------|---------|----------|---------|-----------|---------|
| | Cropland | Orchard | Grassland | Fallow | Cropland | Orchard | Grassland | Fallow |
| OC | 2.7E-06 | 2.1E-06 | 5.1E-03 | 7.2E-05 | 7.5E-07 | 9.2E-10 | 1.0E-05 | 1.7E-08 |
| N | 4.6E-07 | 2.4E-09 | 9.3E-09 | 8.4E-07 | 6.7E-10 | 4.3E-06 | 8.3E-06 | 6.9E-05 |
| C:N ratio | 1.7E-03 | 1.6E-03 | 1.5E-05 | 1.7E-01 | 8.1E-08 | 1.7E-04 | 6.1E-04 | 1.3E-02 |

| Parameters | AEZ 9 | | | | AEZ 5 | | | |
|------------|----------|---------|-----------|---------|----------|---------|-----------|---------|
| | Cropland | Orchard | Grassland | Fallow | Cropland | Orchard | Grassland | Fallow |
| OC | 4.8E-05 | 1.2E-04 | 1.8E-02 | 2.4E-04 | 4.6E-10 | 5.3E-08 | 4.3E-08 | 4.3E-11 |
| N | 6.8E-06 | 2.0E-05 | 3.1E-04 | 1.0E-05 | 5.2E-09 | 1.2E-07 | 1.4E-07 | 7.1E-09 |
| C:N ratio | 2.2E-02 | 3.2E-03 | 7.3E-04 | 3.1E-03 | 2.4E-08 | 5.5E-07 | 1.8E-08 | 4.3E-10 |