# Appendix

Table 12: Sub-watershed based soil erosion factors and soil loss in Meki river watershed

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Zone | SWS | R | C | LS | K | P | A\_2017 | A\_1987 | Standard1 | Standard2 |
| U | W2510 | 548.9 | 0.1004 | 3.7 | 0.231 | 0.918 | 37.044 | 26.8515 | 10 | 18 |
| U | W2530 | 563.73 | 0.038 | 5.924 | 0.24441 | 0.795 | 36.611 | 26 | 10 | 18 |
| U | W2610 | 575 | 0.0374 | 7 | 0.25 | 0.728 | 31.2813 | 37.772 | 10 | 18 |
| U | W2620 | 551.65 | 0.074 | 4.58 | 0.224 | 0.8582 | 36.02 | 17.23 | 10 | 18 |
| M | W2640 | 535.5 | 0.159 | 2.99 | 0.218 | 0.966 | 53.672 | 31.5 | 10 | 18 |
| U | W2750 | 584.205 | 0.03221 | 6.5 | 0.23 | 0.7363 | 25.445 | 21.22 | 10 | 18 |
| U | W2860 | 556.52 | 0.091 | 5.267 | 0.2105 | 0.832 | 30.73 | 14.1434 | 10 | 18 |
| M | W2890 | 550.45 | 0.149 | 3.704 | 0.21 | 0.9124 | 53.52 | 19.7325 | 10 | 18 |
| M | W2970 | 533.72 | 0.1555 | 2.852 | 0.2041 | 0.974 | 57.9413 | 33 | 10 | 18 |
| U | W3080 | 570.4 | 0.049 | 6.923 | 0.234 | 0.761 | 20.446 | 11.77 | 10 | 18 |
| L | W3180 | 503.31 | 0.145 | 1.751 | 0.2324 | 0.99 | 28.034 | 29.39 | 10 | 18 |
| U | W3190 | 599.41 | 0.0511 | 7.15 | 0.2363 | 0.7512 | 28.1 | 26.73 | 10 | 18 |
| L | W3260 | 487 | 0.1461 | 1 | 0.2132 | 1 | 14.911 | 26.5 | 10 | 18 |
| M | W3280 | 538.431 | 0.159 | 1.78 | 0.186 | 0.9834 | 25.9 | 19.18344 | 10 | 18 |
| U | W3300 | 583.872 | 0.033 | 7.2 | 0.245 | 0.72 | 18.2 | 12.122 | 10 | 18 |
| L | W3400 | 511.793 | 0.1442 | 1.71 | 0.232 | 0.998 | 27.9044 | 31.403 | 10 | 18 |
| M | W3410 | 555.421 | 0.18 | 1.67 | 0.1834 | 0.97 | 30.64 | 16.57 | 10 | 18 |
| L | W3460 | 484.45 | 0.1653 | 0.513 | 0.2 | 1 | 7.73325 | 13.1 | 10 | 18 |
| U | W3690 | 624.61 | 0.039 | 7.42 | 0.232 | 0.74 | 18.07 | 10.5 | 10 | 18 |
| M | W3700 | 601.352 | 0.1765 | 2.63 | 0.16143 | 0.925 | 36.8635 | 32.69 | 10 | 18 |
| M | W3730 | 537.281 | 0.17 | 1.351 | 0.15223 | 0.996 | 19.55 | 17.12 | 10 | 18 |
| M | W3790 | 566.42 | 0.2 | 1.784 | 0.16 | 0.97 | 33.96 | 24.29 | 10 | 18 |
| U | W3910 | 643.73 | 0.0751 | 6 | 0.22 | 0.781 | 27.1 | 20.78 | 10 | 18 |
| U | W4030 | 651.571 | 0.121 | 5.6 | 0.22 | 0.793 | 45.76 | 37.0215 | 10 | 18 |
| L | W4070 | 523.04 | 0.15 | 1.64 | 0.199 | 1 | 27.831 | 35 | 10 | 18 |
| M | W4130 | 572 | 0.1601 | 1.77 | 0.18 | 1 | 27.3734 | 31.7 | 10 | 18 |
| U | W4180 | 642.114 | 0.121 | 4.544 | 0.19622 | 0.855 | 35.6 | 42.22 | 10 | 18 |
| L | W4250 | 555.53 | 0.144 | 1.7 | 0.196 | 1 | 24.1651 | 30.43 | 10 | 18 |
| U | W4290 | 654.815 | 0.094 | 3.53 | 0.19 | 0.885 | 30.884 | 39.54 | 10 | 18 |
| M | W4400 | 588.35 | 0.19 | 2 | 0.153 | 0.97 | 36.15 | 29.11 | 10 | 18 |
| M | W4590 | 633.33 | 0.39 | 2.644 | 0.197 | 0.96 | 97.11 | 66.66 | 10 | 18 |
| M | W4620 | 647.1 | 0.24 | 2.5 | 0.16331 | 0.96 | 44.935 | 34.101 | 10 | 18 |
| L | W4720 | 619.71 | 0.16 | 2.425 | 0.181 | 0.99 | 44.11 | 44.754 | 10 | 18 |
| M | W4730 | 674.3 | 0.17 | 3.26 | 0.165 | 0.95 | 44.21 | 29.4104 | 10 | 18 |

Table 13: Regression analysis result for 1987 and 2017 soil losses

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **ANOVA** | | | | | | | |
|  | ***df*** | ***SS*** | ***MS*** | ***F*** | ***Significance F*** | **R Square** | **Standard Error** |
| Regression | 1 | 1888.975 | 1888.97 | 91.27 | 0.000213 | 0.95 | 4.55 |
| Residual | 5 | 103.48 | 20.7 |  |  |  |  |
| Total | 6 | 1992.45 |  |  |  |  |  |

Table 14: RUSLE input factors estimation table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **R: Rainfall Erosivity** | | | | | | | | |
| Rainfall (mm) | 100 | 200 | 400 | 800 | 1200 | 1600 | 2000 | 2400 |
| Factor (R) | 48 | 104 | 217 | 441 | 665 | 890 | 1115 | 1340 |
| **K: Soil Erodibility** | | | | | | | | |
| Soil Colour | Black | Brown | Red | Yellow |  |  |  |  |
| Factor (K) | 0.15 | 0.2 | 0.25 | 0.3 |  |  |  |  |
| **L: Slope Length** | | | | | | | | |
| Length (m) | 5 | 10 | 20 | 40 | 80 | 160 | 240 | 320 |
| Factor L | 0.5 | 0.7 | 1 | 1.4 | 1.9 | 2.7 | 3.2 | 3.8 |
| **S: Slope Gradient** | | | | | | | | |
| Slope (%) | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 |
| Factor (S) | 0.4 | 1 | 1.6 | 2.2 | 3 | 3.8 | 4.3 | 4.8 |
| **C: Land Cover Factor** | | | | | | | | |
| Cover | factor | Cover | factor | Cover | factor | Cover | factor |  |
| Dense forest | 0.001 | Dense grass | 0.01 | Other forest | 0.02 | Degraded grass | 0.05 |  |
| Badlands soft | 0.04 | Badlands hard | 0.05 | Fallow Hard | 0.05 | Fallow Ploughed | 0.6 |  |
| Sorghum, Maize | 0.1 | Ethiopian Teff | 0.25 | Cereals | 0.18 | Continuous fallow | 1 |  |
| Pulses | 0.15 |  |  |  |  |  |  |  |
| **P: Management** | | | | | | | |  |
| Land Management | Factor P | Land Management | Factor P | Land Management | Factor P | Land Management | Factor P |  |
| Ploughing up and Down | 1 | Ploughing on contour | 0.9 | Intercropping | 0.8 | Dense Intercropping | 0.7 |  |
| Strip Cropping | 0.6 | Applying Mulch | 0.5 | Stone Cover (40%) | 0.8 | Stone Cover (80%) | 0.8 |  |
| Source: Source Mekuria (2005); Hellden (1987); Hurni (1985) | | | | | | | | |