

Article

# Effect of Land Use and Land Cover Change on Soil Erosion in Erer Sub-Basin, Northeast Wabi Shebelle Basin, Ethiopia

Gezahegn Weldu Woldemariam <sup>1,\*</sup> and Arus Edo Harka <sup>2</sup>

<sup>1</sup> Geoinformation Science Program, School of Geography and Environmental Studies, Haramaya University, P.O. Box 138, Dire Dawa, Ethiopia

<sup>2</sup> Hydraulic and Water Resources Engineering Department, School of Water Resources and Environmental Engineering, Haramaya Institute of Technology (HiT), Haramaya University, P.O. Box 138, Dire Dawa, Ethiopia, harqaa@gmail.com

\* Correspondence: gezahegnw3@gmail.com; Tel.: +251-091-10-96-14 91

Received: 1 July 2019; Accepted: 10 August 2019; Published: date

**Table S1.** Attributes of soil units and calculated soil erodibility (K) factor.

| Soil Units        | Area (ha) | K <sub>usle</sub> | K    |
|-------------------|-----------|-------------------|------|
| Dystric Cambisols | 121450.35 | 0.37              | 0.36 |
| Haplic Xerosols   | 16015.44  | 0.36              | 0.37 |
| Eutric Cambisols  | 1891.49   | 0.32              | 0.42 |
| Eutric Nitosols   | 47616.50  | 0.36              | 0.37 |
| Eutric Regosols   | 20856.09  | 0.36              | 0.37 |
| Humic Cambisols   | 29803.86  | 0.36              | 0.37 |

15 **Table 2.** List of priority districts identified for SWC in the Erer Sub-Basin.

| Name of District | 1st Priority Level      |                        | 2nd Priority Level      |                        | 3rd Priority Level      |                        | 4th Priority Level      |                        | 5th Priority Level      |                        | 6th Priority Level      |                        | 7th Priority Level      |                        | 8th Priority Level      |                        |
|------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|
|                  | Area (km <sup>2</sup> ) | % of the Priority Area | Area (km <sup>2</sup> ) | % of the Priority Area | Area (km <sup>2</sup> ) | % of the Priority Area | Area (km <sup>2</sup> ) | % of the Priority Area | Area (km <sup>2</sup> ) | % of the Priority Area | Area (km <sup>2</sup> ) | % of the Priority Area | Area (km <sup>2</sup> ) | % of the Priority Area | Area (km <sup>2</sup> ) | % of the Priority Area |
| Babile           | 18.31                   | 18.96                  | 13.07                   | 14.21                  | 11.93                   | 14.42                  | 22.59                   | 16.15                  | 41.21                   | 19.64                  | 95.97                   | 21.61                  | 243.86                  | 27.00                  | 474.01                  | 25.06                  |
| Fedis            | 50.78                   | 52.59                  | 42.05                   | 45.71                  | 33.83                   | 40.89                  | 54.2                    | 38.75                  | 77.44                   | 36.90                  | 174.75                  | 39.35                  | 336.74                  | 37.28                  | 583.69                  | 30.86                  |
| Fik              | 20.75                   | 21.49                  | 14.54                   | 15.80                  | 10.92                   | 13.20                  | 18.93                   | 13.53                  | 37.49                   | 17.87                  | 80.06                   | 18.03                  | 202.59                  | 22.43                  | 662.21                  | 35.01                  |
| Gola Oda         | 0.03                    | 0.03                   | 0.07                    | 0.08                   | 0.05                    | 0.06                   | 0.08                    | 0.06                   | 0.11                    | 0.05                   | 0.20                    | 0.05                   | 0.25                    | 0.03                   | 6.74                    | 0.36                   |
| Gursum           | 0.11                    | 0.11                   | 0.63                    | 0.68                   | 1.19                    | 1.44                   | 2.33                    | 1.67                   | 2.31                    | 1.10                   | 3.53                    | 0.79                   | 3.7                     | 0.41                   | 4.18                    | 0.22                   |
| Haramaya         | 0.09                    | 0.09                   | 0.66                    | 0.72                   | 0.95                    | 1.15                   | 1.95                    | 1.39                   | 2.56                    | 1.22                   | 3.75                    | 0.84                   | 1.15                    | 0.13                   | 4.91                    | 0.26                   |
| Harari           | 4.13                    | 4.28                   | 10.56                   | 11.48                  | 12.35                   | 14.93                  | 21.44                   | 15.33                  | 28.21                   | 13.44                  | 56.16                   | 12.64                  | 88.8                    | 9.83                   | 123.88                  | 6.55                   |
| Jarso            | 0.37                    | 0.38                   | 2.73                    | 2.97                   | 2.49                    | 3.01                   | 2.96                    | 2.12                   | 2.86                    | 1.36                   | 3.83                    | 0.86                   | 4.41                    | 0.49                   | 3.49                    | 0.18                   |
| Kombolcha        | 1.98                    | 2.05                   | 7.69                    | 8.36                   | 9.02                    | 10.90                  | 15.39                   | 11.00                  | 17.65                   | 8.41                   | 25.88                   | 5.83                   | 21.81                   | 2.41                   | 28.52                   | 1.51                   |
| Total            | 96.55                   | 100                    | 92                      | 100                    | 82.73                   | 100                    | 139.87                  | 100                    | 209.84                  | 100                    | 444.13                  | 100                    | 903.31                  | 100                    | 1,891.63                | 100                    |

16



© 2019 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

17