Lab -7 Soil and water Conservation / Practical

3th stage Soil and water Dep.

**Soil tolerance limit (SLTL)(T):**

The maximum rate of erosion which permits land productivity to be sustained economically .The soil tolerance limit range from (1 – 5 ton . Acre -1 . yr -1 ).for the soils of USA which is equivalent to (2.24 – 11.20 ton . ha-1 . yr-1 )

**Acre= 2.24 ha**

**Factors which are considered in define soil tolerance**

1.Soil depth.

2.Soil physical properties

3. Factors affecting root development.

4. Gully prevention

5. On field sedimentation problems.

6. Seeding losses.

7. Reduction in soil organic matter content.

8. Loss of plant nutrients.

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| Erosion class | Erosion class | Erosion rate( t ha-1 yr-1) |
| 1 | Very slight | 0 – 5 |
| 2 | slight | 5 – 10 |
| 3 | Moderate | 10 – 20 |
| 4 | High | 20 – 40 |
| 5 | Severe | 40 - 80 |
| 6 | Very severe | > 80 |

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| **Sub**  **catchment #** | **Rainfall erosivity, R(metric unit)** | **Soil erodibility, K (metric unit)** | **Slope length factor, L** | **Slope steepness factor, S** | **Cropping-Management factor, C** | **Conservation practice factor, P** | **Annual soil loss (t ha-1 yr-1)** |
| 1 | 60.77 | 0.33 | 5.37 | 2.40 | 0.07 | 1.00 | 18.09 |
| 2 | 60.77 | 0.35 | 9.68 | 2.98 | 0.10 | 0.90 | 55.22 |
| 3 | 60.77 | 0.53 | 10.01 | 2.67 | 0.07 | 0.90 | 54.23 |
| 4 | 60.77 | 0.40 | 10.69 | 2.56 | 0.01 | 1.00 | 6.65 |
| 5 | 60.77 | 0.46 | 16.21 | 4.88 | 0.05 | 0.99 | 109.12 |

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| No. | Site | soil depth(cm) | Aggregate score Q | Soil group | SLTL(Mg/ha/yr) |
| 1 | Nawdarokan | 50-100 | 0.685 | 3 | 10 |
| 2 | Darbandi sarw | 25-50 | 0.525 | 2 | 5 |
| 3 | Zyarat | 50-100 | 0.665 | 2 | 7.5 |
| 4 | Shinawa | >150 | 0.505 | 2 | 12.5 |
| 5 | Khoran | 0-25 | 0.655 | 2 | 2.5 |

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| **Subcatchment**  **#** | **Annual soil loss**  **( t ha-1 yr-1)** | **Soil Loss tolerance limit , SLTL**  **( t ha-1 yr-1)** | **Erosion risk**  **( t ha-1 yr-1)** |
| 1 | 19.03 | 10.00 |  |
| 2 | 55.27 | 10.00 |  |
| 3 | 28.73 | 12.50 |  |
| 4 | 4.64 | 2.50 |  |
| 5 | 101.86 | 6.67 |  |