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# Estimation of Watershed Erosion and Sediment Delivery Ratio Formulas

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# List of 10 Estimation of Watershed Erosion and Sediment Delivery Ratio Formulas

## Estimation of Watershed Erosion and Sediment Delivery Ratio

### 1) Area of Catchment given Annual Sediment Yield Rate

$$\text{fx } A = \left( \frac{0.00323}{q_{sv}} \right)^{\frac{1}{0.28}}$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b\_img.jpg\)](#)

$$\text{ex } 0.530433\text{km}^2 = \left( \frac{0.00323}{0.0038575} \right)^{\frac{1}{0.28}}$$

### 2) Area of Catchment given Volume of Sediment Yield per Year

$$\text{fx } A = \left( \frac{Q_{sv}}{0.00323} \right)^{\frac{1}{0.72}}$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d\_img.jpg\)](#)

$$\text{ex } 3.351084\text{km}^2 = \left( \frac{0.007715}{0.00323} \right)^{\frac{1}{0.72}}$$



### 3) Catchment Area given Annual Sediment Yield Rate

[Open Calculator !\[\]\(4729e517bc6a7cd81c8025b9646574fb\_img.jpg\)](#)

$$\text{fx } A = \left( \frac{0.00597}{q_{sv}} \right)^{\frac{1}{0.24}}$$

$$\text{ex } 6.169997\text{km}^2 = \left( \frac{0.00597}{0.0038575} \right)^{\frac{1}{0.24}}$$

### 4) Catchment Area given Volume of Sediment Yield per Year

[Open Calculator !\[\]\(e474458956c9a37fbf9586ddb60a7fa1\_img.jpg\)](#)

$$\text{fx } A = \left( \frac{Q_{sv}}{0.00597} \right)^{\frac{1}{0.76}}$$

$$\text{ex } 1.401291\text{km}^2 = \left( \frac{0.007715}{0.00597} \right)^{\frac{1}{0.76}}$$

### 5) Dhruv Narayan Et Al's Equation for Annual Runoff Volume

[Open Calculator !\[\]\(4fe57c3593bf1b21d272ae7ac8dfaf77\_img.jpg\)](#)

$$\text{fx } Q_v = \frac{Q_s - 5.5}{11.1}$$

$$\text{ex } 19.5\text{m}^3 = \frac{221.95 - 5.5}{11.1}$$

### 6) Dhruv Narayan Et Al's Equation for Annual Sediment Yield Rate

[Open Calculator !\[\]\(2bae76de5ebbd5c4d7d47162f1673734\_img.jpg\)](#)

$$\text{fx } Q_s = (5.5 + (11.1 \cdot Q_v))$$

$$\text{ex } 221.95 = (5.5 + (11.1 \cdot 19.5\text{m}^3))$$



### 7) Joglekar's Equation for Annual Sediment Yield Rate

$$\text{fx } q_{sv} = \left( \frac{0.00597}{A^{0.24}} \right)$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95\_img.jpg\)](#)

$$\text{ex } 0.005055 = \left( \frac{0.00597}{(2.0\text{km}^2)^{0.24}} \right)$$

### 8) Joglekar's Equation for Volume of Sediment Yield per Year from Catchment Area

$$\text{fx } Q_{sv} = \left( 0.00597 \cdot A^{0.76} \right)$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2\_img.jpg\)](#)

$$\text{ex } 0.01011 = \left( 0.00597 \cdot (2.0\text{km}^2)^{0.76} \right)$$

### 9) Khosla's Equation for Annual Sediment Yield Rate

$$\text{fx } q_{sv} = \frac{0.00323}{A^{0.28}}$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7\_img.jpg\)](#)

$$\text{ex } 0.00266 = \frac{0.00323}{(2.0\text{km}^2)^{0.28}}$$



## 10) Khosla's Equation for Volume of Sediment Yield per Year from Catchment Area

$$\text{fx } Q_{sv} = 0.00323 \cdot (A^{0.72})$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a\_img.jpg\)](#)

$$\text{ex } 0.00532 = 0.00323 \cdot ((2.0\text{km}^2)^{0.72})$$



## Variables Used

- **A** Area of Catchment (*Square Kilometer*)
- **$Q_s$**  Annual Sediment Yield Rate from Watershed
- **$q_{sv}$**  Annual Sediment Yield Rate
- **$Q_{sv}$**  Volume of Sediment Yield per Year
- **$Q_v$**  Runoff Volume (*Cubic Meter*)



## Constants, Functions, Measurements used

- **Measurement: Volume** in Cubic Meter ( $\text{m}^3$ )  
*Volume Unit Conversion* 
- **Measurement: Area** in Square Kilometer ( $\text{km}^2$ )  
*Area Unit Conversion* 



## Check other formula lists

- [Erosion and Sediment Deposits Formulas](#) 
- [Estimation of Watershed Erosion and Sediment Delivery Ratio](#)
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