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Empirical Equations of Runoff Volume Formulas

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List of 23 Empirical Equations of Runoff Volume Formulas

Empirical Equations of Runoff Volume

Inglis and Dsouza Formula (1929)

1) Equation for Runoff for Deccan Plateau

$$fx \quad R = \left(\frac{1}{254} \right) \cdot P \cdot (P - 17.8)$$

Open Calculator 

$$ex \quad 16.88976\text{cm} = \left(\frac{1}{254} \right) \cdot 75\text{cm} \cdot (75\text{cm} - 17.8)$$

2) Equation for Runoff for Ghat Regions of Western India

$$fx \quad R = 0.85 \cdot P - 30.5$$

Open Calculator 

$$ex \quad 33.25\text{cm} = 0.85 \cdot 75\text{cm} - 30.5$$

Barlow's Formula (1915)

3) Barlow's Formula for Runoff

$$fx \quad R = K_b \cdot P$$

Open Calculator 

$$ex \quad 11.25\text{cm} = 0.15 \cdot 75\text{cm}$$



4) Barlow's Formula for Runoff in Average Catchment with Average or Varying Rainfall

$$fx \quad R = 0.20 \cdot P$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)

$$ex \quad 15cm = 0.20 \cdot 75cm$$

5) Barlow's Formula for Runoff in Average Catchment with Continuous Downpour

$$fx \quad R = 0.32 \cdot P$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0_img.jpg\)](#)

$$ex \quad 24cm = 0.32 \cdot 75cm$$

6) Barlow's Formula for Runoff in Average Catchment with Light Rain

$$fx \quad R = 0.16 \cdot P$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f_img.jpg\)](#)

$$ex \quad 12cm = 0.16 \cdot 75cm$$

7) Barlow's Formula for Runoff in Flat Cultivated and Absorbent Soils with Average or Varying Rainfall

$$fx \quad R = 0.10 \cdot P$$

[Open Calculator !\[\]\(b64b40baaee5acddc1eab8538ba84754_img.jpg\)](#)

$$ex \quad 7.5cm = 0.10 \cdot 75cm$$

8) Barlow's Formula for Runoff in Flat Cultivated and Absorbent Soils with Continuous Downpour

$$fx \quad R = 0.15 \cdot P$$

[Open Calculator !\[\]\(aff7c69c44a5e015f18c35867ef3f5c3_img.jpg\)](#)

$$ex \quad 11.25cm = 0.15 \cdot 75cm$$



9) Barlow's Formula for Runoff in Flat Cultivated and Absorbent Soils with Light Rain

$$fx \quad R = 0.07 \cdot P$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)

$$ex \quad 5.25\text{cm} = 0.07 \cdot 75\text{cm}$$

10) Barlow's Formula for Runoff in Flat Partly Cultivated Stiff Soils with Average or Varying Rainfall

$$fx \quad R = 0.15 \cdot P$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)

$$ex \quad 11.25\text{cm} = 0.15 \cdot 75\text{cm}$$

11) Barlow's Formula for Runoff in Flat Partly Cultivated Stiff Soils with Continuous Downpour

$$fx \quad R = 0.18 \cdot P$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)

$$ex \quad 13.5\text{cm} = 0.18 \cdot 75\text{cm}$$

12) Barlow's Formula for Runoff in Flat Partly Cultivated Stiff Soils with Light Rain

$$fx \quad R = 0.12 \cdot P$$

[Open Calculator !\[\]\(899d8b7697d64725bf017d3296cfcf1b_img.jpg\)](#)

$$ex \quad 9\text{cm} = 0.12 \cdot 75\text{cm}$$



13) Barlow's Formula for Runoff in Hills and Plains with Little Cultivation and Continuous Downpour

$$fx \quad R = 0.60 \cdot P$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a_img.jpg\)](#)

$$ex \quad 45\text{cm} = 0.60 \cdot 75\text{cm}$$

14) Barlow's Formula for Runoff in Hills and Plains with Little Cultivation and Light Rainfall

$$fx \quad R = 0.28 \cdot P$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021_img.jpg\)](#)

$$ex \quad 21\text{cm} = 0.28 \cdot 75\text{cm}$$

15) Formula for Runoff in Hills and Plains with Little Cultivation and Average or Varying Rainfall

$$fx \quad R = 0.35 \cdot P$$

[Open Calculator !\[\]\(bd3b31712ad9bab5a241210fa6925cdd_img.jpg\)](#)

$$ex \quad 26.25\text{cm} = 0.35 \cdot 75\text{cm}$$

16) Formula for Runoff in Very Hilly, Steep and Hardly any Cultivation Catchment with Light Rain

$$fx \quad R = 0.36 \cdot P$$

[Open Calculator !\[\]\(7bc43b319a082987e20f7bf78f4bab80_img.jpg\)](#)

$$ex \quad 27\text{cm} = 0.36 \cdot 75\text{cm}$$



17) Runoff in Very Hilly, Steep and Hardly any Cultivation Catchment with Average or Varying Rainfall

$$fx \quad R = 0.45 \cdot P$$

[Open Calculator !\[\]\(d3fb9f94af8b26d1c844efa9a98805b0_img.jpg\)](#)

$$ex \quad 33.75\text{cm} = 0.45 \cdot 75\text{cm}$$

18) Runoff in Very Hilly, Steep and Hardly any Cultivation Catchment with Continuous Downpour

$$fx \quad R = 0.81 \cdot P$$

[Open Calculator !\[\]\(e1d6102fe77919492c04879c8450f1f5_img.jpg\)](#)

$$ex \quad 60.75\text{cm} = 0.81 \cdot 75\text{cm}$$

Khoslas's Formula (1960)

19) Mean Monthly Temperature of Catchment given Monthly Losses

$$fx \quad T_f = \frac{L_m}{0.48}$$

[Open Calculator !\[\]\(104fbf564e2e5a8fbd84f31656d114c7_img.jpg\)](#)

$$ex \quad 29.16667^\circ\text{C} = \frac{14\text{cm}}{0.48}$$

20) Monthly Losses given Mean Monthly Temperature of Catchment

$$fx \quad L_m = 0.48 \cdot T_f$$

[Open Calculator !\[\]\(21226b58c700e5231ab98d27101bac58_img.jpg\)](#)

$$ex \quad 14.4\text{cm} = 0.48 \cdot 30^\circ\text{C}$$



21) Monthly Losses using Monthly Runoff

$$fx \quad L_m = P_m - R_m$$

[Open Calculator !\[\]\(9dfdaff1d86ba3c1f8353b4d1b61b8c5_img.jpg\)](#)

$$ex \quad 14cm = 32cm - 18cm$$

22) Monthly Precipitation given Monthly Runoff

$$fx \quad P_m = R_m + L_m$$

[Open Calculator !\[\]\(2b376d1a92330ab09dad2665d2f89bf5_img.jpg\)](#)

$$ex \quad 32cm = 18cm + 14cm$$

23) Monthly Runoff

$$fx \quad R_m = P_m - L_m$$

[Open Calculator !\[\]\(c444627dab9fee9a1550c053ffaaaae2_img.jpg\)](#)

$$ex \quad 18cm = 32cm - 14cm$$



Variables Used

- K_b Barlow's Runoff Coefficient
- L_m Monthly Losses (Centimeter)
- P Rainfall (Centimeter)
- P_m Monthly Rainfall (Centimeter)
- R Runoff (Centimeter)
- R_m Monthly Runoff (Centimeter)
- T_f Mean Monthly Temperature (Celsius)




Constants, Functions, Measurements used

- **Measurement: Length** in Centimeter (cm)
Length Unit Conversion 
- **Measurement: Temperature** in Celsius ($^{\circ}\text{C}$)
Temperature Unit Conversion 



Check other formula lists

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