***NOTE**: The MPI value shown for Bankner ward is illustrative; the same standardized calculation methodology and weighting framework is uniformly applied to all wards using their respective ward-level data.*

M.P.I. CALCULATION

1.) Defining 5 factors

Component	Weight
Drainage & Infrastructure (DI)	0.35
Historical Flood Exposure (HF)	0.25
Rainfall & Topography (RT)	0.2
Urban Stress / Encroachment (US)	0.1
Response Capacity (RC)	0.1
Total	**1**

2.) Collecting Raw Data

I) **Drainage & Infrastructure**

- Drain density: 1.2 km/sq km
- % drains desilted: 40%

II) Historical Flood Exposure

- Avg waterlogging duration: 6 hours
- Flood incidents (5 yrs): 8

III) Rainfall & Topography

- Avg monsoon rainfall: 980 mm
- Elevation: low-lying (flat)

IV) Urban Stress

- Impervious surface: 78%
- Drain encroachments: High

V) Response Capacity

- Pump deployment time: 4 hours
- Complaint resolution time: 48 hours

3.) Normalization (0-1 scale)

Parameter	Min	Max
Drain density	0.5	5
Desilting %	30	100
Waterlogging hrs	0.5	8
Flood incidents	0	10
Impervious %	40	85
Pump time (hrs)	1	6

4.) Drainage & Infrastructure Score

I) Drain density
(1.2 – 0.5) / (5.0 – 0.5) = 0.155

II) Desilting %
(40 – 30) / (100 – 30) = 0.143

III) Average DI Score
DI = (0.155 + 0.143) / 2 = 0.149

5.) Historical Flood Exposure (risk → inverted)

I)Waterlogging duration

(6 – 0.5) / (8 – 0.5) = 0.733

Inverted = 1 – 0.733 = 0.267

II) Flood Incidents

(8 – 0) / (10 – 0) = 0.8

Inverted = 1 – 0.8 = 0.2

III) HF Score

HF = (0.267 + 0.2) / 2 = 0.233

6.) Rainfall & Topography

Combined normalized score

RT = 0.35

(low elevation+ high rainfall penalty)

7.) Urban Stress

US = 0.20

(Impervious surface + encroachments)

8.) Response Capacity

RC = 0.25

(slow pump deployment + slow grievance response)

9.) Final M.P.I Calculation

Formula

MPI =

0.35×DI + 0.25×HF + 0.20×RT +

0.10×US + 0.10×RC

Substitute Bankner values

MPI =

0.35×0.149 + 0.25×0.233 + 0.20×0.35

+ 0.10×0.20 + 0.10×0.25

Solve to get final M.P.I

MPI ≈ 0.30

10.) Risk Interpretation

MPI	Meaning
0.3	🔴 Very High Flood Risk
Reason	Poor drainage + repeated flooding + high urban stress