

Disaster Risk Priority Report (NCR)

1. Summary Statistics

Total Barangays Analyzed: 935

High Risk: 308 (32.9%)

Moderate Risk: 490 (52.4%)

Low Risk: 137 (14.7%)

DPI mean=5.60 median=5.35 std=2.06 min=1.10 max=10.00

2. Top 10 Highest-DPI Barangays

Barangay	City	DPI	CSI	Risk Class	Archetype
Katipunan	Quezon City	10.00	10.00	High	HighDensity-HighEx
Barangay 52	Manila	10.00	10.00	High	HighDensity-HighEx
Barangay 155	Manila	10.00	10.00	High	HighDensity-HighEx
Barangay 114	Caloocan	10.00	10.00	High	HighDensity-HighEx
Barangay 63	Manila	10.00	10.00	High	HighDensity-HighEx
Barangay 199	Manila	10.00	10.00	High	HighDensity-HighEx
Barangay 200	Manila	10.00	10.00	High	HighDensity-HighEx
Barangay 32	Caloocan	10.00	10.00	High	HighDensity-HighEx
Barangay 153	Manila	10.00	10.00	High	HighDensity-HighEx
Barangay 78	Manila	10.00	10.00	High	HighDensity-HighEx

3. K-Means Clustering Diagnostics

Number of Clusters (K): 6

Silhouette Score: 0.3835

Davies-Bouldin Index: 0.9881

Calinski-Harabasz Index: 368.90

Archetype Distribution:

LowDensity-LowExposure: 531 (56.8%)

HighDensity-HighExposure: 311 (33.3%)

HighDensity-LowExposure: 65 (7.0%)

LowDensity-HighExposure: 28 (3.0%)

4. Supervised Model Performance (Agreement with DPI)

Note: Models predict index-derived targets (DPI). High accuracy reflects learnability of the deterministic benchmark, not real-world flood prediction.

Primary: 5-Fold Stratified Cross-Validated Performance

Model	CV F1w (mean+/-std)	CV F1macro (mean+/-std)	Type
Random Forest	0.9400 +/- 0.0514	0.9377 +/- 0.0560	Primary
Gradient Boosting	0.9646 +/- 0.0232	0.9637 +/- 0.0271	Primary
Neural Network (MLP)	0.9242 +/- 0.0325	0.9159 +/- 0.0368	Primary

Model	CV RMSE (mean+/-std)	CV MAE (mean+/-std)	Type
Random Forest	0.2246 +/- 0.0113	0.1398 +/- 0.0091	Primary
Gradient Boosting	0.1914 +/- 0.0106	0.1308 +/- 0.0067	Primary
Neural Network (MLP)	0.4146 +/- 0.0203	0.3333 +/- 0.0149	Primary

Secondary: Single-Split Test Set Performance (80/20)

Classification (target: DPI_Risk_Class)

Model	Acc	BalAcc	F1w	F1macro	Type
Dummy (Majority Class)	52.41%	33.33%	36.04%	22.92%	Baseline
Logistic Regression	85.56%	85.46%	85.68%	86.77%	Baseline
Shallow Decision Tree	71.12%	71.92%	71.76%	69.29%	Baseline
Ordinal Ridge (rounded)	82.35%	76.76%	82.07%	80.24%	Baseline
Random Forest	95.19%	94.56%	95.19%	94.65%	Primary
Gradient Boosting	95.72%	95.10%	95.72%	95.42%	Primary
Neural Network (MLP)	93.58%	92.25%	93.58%	92.93%	Primary

Confusion Matrices (held-out test split)

Rows = true, Cols = predicted. [Low(0), Moderate(1), High(2)]

Dummy (Majority Class): [[0, 27, 0], [0, 98, 0], [0, 62, 0]]

Logistic Regression: [[23, 4, 0], [0, 84, 14], [0, 9, 53]]

Shallow Decision Tree: [[21, 6, 0], [21, 72, 5], [1, 21, 40]]

Ordinal Ridge (rounded): [[16, 11, 0], [0, 87, 11], [0, 11, 51]]

Gradient Boosting: [[25, 2, 0], [1, 94, 3], [0, 2, 60]]

Regression (target: DPI score)

Model	RMSE	MAE	Type
Dummy (Mean Predictor)	2.0422	1.6543	Baseline
Ridge Regression	0.7885	0.6561	Baseline
Random Forest	0.2274	0.1459	Primary
Gradient Boosting	0.1911	0.1278	Primary
Neural Network (MLP)	0.4094	0.3293	Primary

5. Risk Category Details (Top 10 per Category)

High Risk

Barangay	City	DPI	CSI	Archetype	Recommendation
Barangay 78	Manila	10.00	10.00	HighDensit	Priority Zone: High density +
Barangay 50	Manila	10.00	10.00	HighDensit	Priority Zone: High density +
Barangay 199	Manila	10.00	10.00	HighDensit	Priority Zone: High density +
Barangay 138	Pasay	10.00	10.00	HighDensit	Priority Zone: High density +
Barangay 139	Pasay	10.00	10.00	HighDensit	Priority Zone: High density +
Barangay 145	Pasay	10.00	10.00	HighDensit	Priority Zone: High density +
Barangay 32	Caloocan	10.00	10.00	HighDensit	Priority Zone: High density +
Barangay 137	Pasay	10.00	10.00	HighDensit	Priority Zone: High density +
Barangay 98	Manila	10.00	10.00	HighDensit	Priority Zone: High density +
Barangay 99	Manila	10.00	10.00	HighDensit	Priority Zone: High population

Moderate Risk

Barangay	City	DPI	CSI	Archetype	Recommendation
San Miguel	Pasig	6.40	8.00	LowDensity	Watch Zone: Moderate DPI with
Masambong	Quezon City	6.40	8.00	HighDensit	Watch Zone: Moderate DPI with
Barangay 129	Pasay	6.40	4.00	HighDensit	Watch Zone: Moderate DPI with
Manggahan	Pasig	6.40	8.00	LowDensity	Watch Zone: Moderate DPI with
Daang Bakal	Mandaluyong	6.40	8.00	HighDensit	Watch Zone: Moderate DPI with
Barangay 197	Manila	6.40	8.00	HighDensit	Watch Zone: Moderate DPI with
Barangay 275	Manila	6.25	3.75	LowDensity	Watch Zone: Moderate risk. Con
Barangay 92	Caloocan	6.25	5.75	LowDensity	Watch Zone: Moderate risk. Con
Barangay 111	Manila	6.25	3.75	HighDensit	Watch Zone: Moderate DPI with
Barangay 1	Pasay	6.25	3.75	LowDensity	Watch Zone: Moderate risk. Con

Low Risk

Barangay	City	DPI	CSI	Archetype	Recommendation
Post Proper Northsid	Makati	3.40	3.00	LowDensity	Low Priority: Maintenance and
Sauyo	Quezon City	3.40	3.00	LowDensity	Low Priority: Maintenance and
Tabacalera	Pateros	3.40	3.00	LowDensity	Low Priority: Maintenance and
Sun Valley	Parañaque	3.40	3.00	LowDensity	Low Priority: Maintenance and
Bagumbayan North	Navotas	3.40	3.00	LowDensity	Low Priority: Maintenance and
Barangay 150	Caloocan	3.25	0.75	LowDensity	Low Priority: Maintenance and
Barangay 11	Caloocan	3.10	2.50	LowDensity	Low Priority: Maintenance and
San Roque	Quezon City	3.10	2.50	LowDensity	Low Priority: Maintenance and
Socorro	Quezon City	3.10	2.50	LowDensity	Low Priority: Maintenance and
Guadalupe Nuevo	Makati	3.10	2.50	LowDensity	Low Priority: Maintenance and