COUNTRY EXPOSURE MODEL

Review main statistic of a exposure model and create summaries for a given Country.

```
/home/risk/venvs/py38w/lib/python3.8/site-packages/geopandas/_compat.py:111: UserWarning: The Sh
apely GEOS version (3.9.1-CAPI-1.14.2) is incompatible with the GEOS version PyGEOS was compiled
with (3.10.1-CAPI-1.16.0). Conversions between both will be slow.
  warnings.warn(
```

```python
# Parameters
country = "India"
```

```
Exposure files:
  Exposure_Com_India.csv
  Exposure_Ind_India.csv
  Exposure_Res_India.csv
```

Sanity checks and formats

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	1,373.5M	203,636.5K	$2,218.2B	87.60%	74.47%
Ind	0.0M	4,928.9K	$212.3B	2.12%	7.13%
Com	0.0M	23,887.8K	$548.2B	10.28%	18.40%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	17,462.0M	$2,306.1B	75	$171
Res	15,197.7M	$1,801.9B	75	$146
Ind	511.0M	$127.0B	104	$416
Com	1,753.3M	$377.2B	73	$313

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Uttar Pradesh	$374,448.7M	30,658.9K	233,337.6K	12.57%	13.19%	16.99%
Maharashtra	$325,504.4M	20,632.6K	125,377.0K	10.93%	8.88%	9.13%
Gujarat	$237,833.3M	11,171.7K	70,645.7K	7.98%	4.81%	5.14%
Tamil Nadu	$195,114.8M	15,183.7K	76,653.7K	6.55%	6.53%	5.58%
Karnataka	$193,950.9M	12,593.9K	67,165.2K	6.51%	5.42%	4.89%
West Bengal	$189,971.9M	18,748.3K	98,516.3K	6.38%	8.07%	7.17%
Bihar	$166,346.1M	19,368.1K	124,925.4K	5.58%	8.33%	9.10%
Rajasthan	$156,048.4M	13,409.5K	80,161.2K	5.24%	5.77%	5.84%
Madhya Pradesh	$152,521.6M	15,234.5K	85,564.6K	5.12%	6.55%	6.23%
Kerala	$145,178.6M	8,711.2K	35,630.6K	4.87%	3.75%	2.59%
Delhi	$114,152.9M	2,095.1K	20,953.1K	3.83%	0.90%	1.53%
Punjab	$97,962.5M	4,339.3K	30,482.8K	3.29%	1.87%	2.22%
Andhra Pradesh	$90,658.3M	10,457.6K	53,064.1K	3.04%	4.50%	3.86%
Haryana	$83,861.0M	4,300.0K	29,835.5K	2.82%	1.85%	2.17%
Telangana	$81,164.7M	6,827.8K	37,791.4K	2.72%	2.94%	2.75%
Odisha	$71,218.9M	9,412.4K	44,105.7K	2.39%	4.05%	3.21%
Assam	$70,913.6M	7,351.4K	35,406.9K	2.38%	3.16%	2.58%
Jharkhand	$56,999.2M	6,331.3K	38,994.9K	1.91%	2.72%	2.84%
Chhattisgarh	$46,805.0M	5,839.4K	29,836.9K	1.57%	2.51%	2.17%
Jammu and Kashmir	$33,495.2M	1,928.2K	13,501.2K	1.12%	0.83%	0.98%
Uttarakhand	$27,932.6M	1,888.3K	11,509.2K	0.94%	0.81%	0.84%
Himachal Pradesh	$18,330.0M	1,592.5K	7,417.0K	0.62%	0.69%	0.54%
Tripura	$8,069.5M	1,076.2K	4,110.8K	0.27%	0.46%	0.30%
Manipur	$5,921.9M	609.6K	3,191.3K	0.20%	0.26%	0.23%
Chandigarh	$5,601.2M	115.0K	1,219.4K	0.19%	0.05%	0.09%
Goa	$5,199.7M	330.8K	1,566.1K	0.17%	0.14%	0.11%
Meghalaya	$4,672.4M	572.1K	3,325.8K	0.16%	0.25%	0.24%
Nagaland	$3,817.4M	452.6K	2,210.9K	0.13%	0.19%	0.16%
Dadra and Nagar Haveli and Daman and Diu	$3,436.7M	157.5K	1,169.1K	0.12%	0.07%	0.09%
Puducherry	$3,348.8M	226.8K	1,607.2K	0.11%	0.10%	0.12%
Mizoram	$2,424.6M	245.9K	1,227.8K	0.08%	0.11%	0.09%
Arunachal Pradesh	$2,080.0M	294.6K	1,544.5K	0.07%	0.13%	0.11%
Sikkim	$1,697.1M	134.0K	682.5K	0.06%	0.06%	0.05%
Andaman and Nicobar Islands	$1,170.4M	98.0K	402.0K	0.04%	0.04%	0.03%
Ladakh	$585.2M	53.5K	299.4K	0.02%	0.02%	0.02%
Lakshadweep	$353.7M	10.9K	68.5K	0.01%	0.00%	0.00%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
RC	$986.4B	20,365.7K	305.6M	33.11%	8.76%	22.25%
MUR	$691.6B	80,547.7K	495.1M	23.22%	34.65%	36.04%
MIX	$378.7B	17,739.0K	36.9M	12.71%	7.63%	2.69%
ADO/E	$319.7B	67,786.7K	313.8M	10.73%	29.16%	22.85%
MCF	$228.2B	4,204.6K	70.2M	7.66%	1.81%	5.11%
W	$122.6B	10,376.7K	21.0M	4.12%	4.46%	1.53%
OT	$97.8B	26,296.9K	130.9M	3.28%	11.31%	9.53%
S	$77.5B	1,533.2K	0.0M	2.60%	0.66%	0.00%
M	$76.4B	3,602.9K	0.0M	2.56%	1.55%	0.00%

Exposure by taxonomy

Showing only taxonomies that represent 90% of the total `COST_USD`

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
ADO/E	MUR+ADO/LWAL/H:1/RES	$244.6B	60,817.0K	9.15%	27.97%
MUR	MUR+CLBRS/LWAL/H:1/RES	$221.5B	36,577.3K	8.28%	16.82%
RC	CR1/LFINF/H:2/RES	$203.2B	6,444.3K	7.60%	2.96%
	CR/LFINF/H:2/RES	$172.5B	2,129.9K	6.45%	0.98%
	CR/LFINF/H:1/RES	$163.2B	9,102.7K	6.10%	4.19%
	CR/LFINF/H:4-6/RES	$155.2B	853.3K	5.80%	0.39%
MUR	MUR+CLBRS/LWAL/H:2/RES	$117.2B	7,384.2K	4.38%	3.40%
	MUR+STDRE/LWAL/H:1/RES	$108.7B	17,977.7K	4.06%	8.27%
MCF	MCF+CLBRS/LWAL/H:2/RES	$96.0B	1,641.0K	3.59%	0.75%
RC	CR/LFINF/H:7-10/RES	$89.1B	147.5K	3.33%	0.07%
OT	LN/EWV/H:1/RES	$79.1B	21,685.3K	2.96%	9.97%
MUR	MUR+STDRE/LWAL/H:2/RES	$68.8B	4,124.1K	2.57%	1.90%
	MUR+CLBRS/LWAL/H:3/RES	$65.3B	2,556.9K	2.44%	1.18%
MIX	MIX(C-S)/LO+DUL/H:1/COM	$64.2B	2,755.2K	2.40%	1.27%
MCF	MCF+CLBRS/LWAL/H:1/RES	$59.6B	591.1K	2.23%	0.27%
M	M+ST/LWAL/DNO/H:1/COM	$53.3B	3,041.6K	1.99%	1.40%
ADO/E	M+ADO/LWAL+DNO/H:1/COM	$51.9B	3,449.0K	1.94%	1.59%
W	W+WS/LFM+DNO/H:1/COM	$49.1B	4,210.6K	1.83%	1.94%
MCF	MCF+CLBRS/LWAL/H:1/RES	$47.4B	1,801.8K	1.77%	0.83%
MIX	MIX(C-W)/LO+DUL/H:1:1/IND	$43.1B	821.0K	1.61%	0.38%
	MIX(M-W)/LO+DUL/H:1/COM	$42.4B	1,818.5K	1.58%	0.84%
W	W+WS/LFM+DNO/H:1/COM	$40.5B	1,740.0K	1.52%	0.80%
MUR	MUR+STDRE/LWAL/H:3/RES	$40.4B	1,488.8K	1.51%	0.68%
	MUR+STRUB/LN/H:1/RES	$29.9B	5,929.5K	1.12%	2.73%
MIX	MIX(C-S)/LO+DNO/H:1/COM	$28.2B	2,418.3K	1.05%	1.11%
S	S/LFBR+DUL/H:1/IND	$26.1B	439.8K	0.98%	0.20%
MCF	MCF+CLBRS/LWAL/H:4-6/RES	$25.2B	170.7K	0.94%	0.08%
S	S/LFM+DUL/H:1/IND	$24.3B	410.5K	0.91%	0.19%
MIX	MIX(W-M)/LO/H:1/RES	$19.9B	3,103.0K	0.74%	1.43%
	MIX(S-W)/LO+DUL/H:1/IND	$19.1B	381.2K	0.72%	0.18%
RC	CR/LFM+DUL/H:1/RES	$19.0B	757.7K	0.71%	0.35%
	CR/LFM+DUL/H:6/COM	$17.8B	54.6K	0.67%	0.03%
	CR/LFINF/H:11-15/RES	$17.6B	9.4K	0.66%	0.00%
	CR/LFM+DUL/H:5/COM	$17.3B	68.9K	0.65%	0.03%
MIX	MIX(W-M)/LO/H:2/RES	$16.3B	1,007.0K	0.61%	0.46%
MUR	MUR+STRUB/LN/H:2/RES	$15.2B	2,147.0K	0.57%	0.99%
MIX	MIX(C-W)/LO+DUL/H:1/COM	$14.8B	636.5K	0.55%	0.29%
M	M+ST/LWAL+DNO/H:1/IND	$14.4B	392.5K	0.54%	0.18%
S	S/LO+DUL/H:1/IND	$14.2B	239.3K	0.53%	0.11%
RC	CR/LWAL/H:11-15/RES	$14.1B	10.4K	0.53%	0.00%
ADO/E	MUR+ADO/LWAL/H:2/RES	$13.9B	3,166.4K	0.52%	1.46%
MIX	MIX(M-W)/LO+DUL/H:1/IND	$13.1B	261.2K	0.49%	0.12%
W	W+WBB/LPB/H:1/RES	$12.9B	2,098.4K	0.48%	0.97%
S	S/LO+DNO/H:1/IND	$12.6B	426.1K	0.47%	0.20%
RC	CR/LFM+DUL/H:3/COM	$12.5B	124.2K	0.47%	0.06%