

# 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 Shapely 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(
```

```
# Parameters
country = "Panama"
```

Exposure files:  
Exposure\_Com\_Panama.csv  
Exposure\_Ind\_Panama.csv  
Exposure\_Res\_Panama.csv

## Sanity checks and formats

**Panama**  
Exposure/Exposure/Exposure\_Com\_Panama.csv  
Exposure/Exposure/Exposure\_Ind\_Panama.csv  
Exposure/Exposure/Exposure\_Res\_Panama.csv  
Occupants / Dwellings = 3.7  
Reference avg household size (2019) = 3.58  
**WARNING - Check population:**  
Exposure population = 3380.0k  
UN 2021 population = 4382.0k  
Population (exposure / UN\_2021) = 0.77  
**WARNING: ADM\_1 with empty values:**  
OCCUPANCY Com Ind Res  
ID\_1  
8 NaN NaN Kuna Yala  
**Exposure models OK**

## Exposure at National level

### Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	3,380.2K	745.7K	\$72.5B	94.61%	72.33%
Ind	0.0K	7.5K	\$11.9B	0.95%	11.90%
Com	0.0K	35.0K	\$15.8B	4.44%	15.77%

### Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	123.9M	\$67.3B	157	\$809
Res	97.7M	\$52.0B	131	\$743
Ind	9.8M	\$5.9B	1,316	\$1,212
Com	16.4M	\$9.4B	470	\$963

## Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Panamá	\$49,190.0M	277,397	1,245.4K	49.06%	35.20%	36.85%
Chiriquí	\$12,092.1M	104,966	400.8K	12.06%	13.32%	11.86%
Panamá Oeste	\$10,224.8M	109,160	463.7K	10.20%	13.85%	13.72%
Colón	\$6,005.9M	53,173	241.9K	5.99%	6.75%	7.16%
Veraguas	\$5,856.6M	59,700	230.8K	5.84%	7.57%	6.83%
Coclé	\$5,666.6M	55,504	233.6K	5.65%	7.04%	6.91%
Herrera	\$4,052.8M	30,337	106.5K	4.04%	3.85%	3.15%
Los Santos	\$3,488.5M	29,120	89.5K	3.48%	3.69%	2.65%
Bocas del Toro	\$1,895.9M	23,712	122.7K	1.89%	3.01%	3.63%
Ngöbe Buglé	\$706.3M	25,639	153.8K	0.70%	3.25%	4.55%
Emberá	\$473.3M	2,715	10.0K	0.47%	0.34%	0.30%
Darién	\$458.1M	11,733	48.3K	0.46%	1.49%	1.43%
Kuna Yala	\$155.8M	4,976	33.1K	0.16%	0.63%	0.98%

## Exposure by simplified taxonomy

Adding `MACRO\_TAXO` column

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
MCF	\$33,862.9M	205.9K	840.4K	33.77%	26.13%	24.86%
RC	\$23,683.1M	66.3K	437.1K	23.62%	8.41%	12.93%
MR	\$22,582.5M	185.8K	816.7K	22.52%	23.57%	24.16%
S	\$9,828.5M	11.6K	0.0K	9.80%	1.47%	0.00%
MUR	\$5,302.6M	166.7K	625.3K	5.29%	21.16%	18.50%
W	\$4,128.3M	117.6K	505.8K	4.12%	14.92%	14.96%
ADO/E	\$472.9M	18.4K	75.6K	0.47%	2.33%	2.24%
OT	\$405.9M	15.8K	79.2K	0.40%	2.00%	2.34%

## Exposure by taxonomy

Showing only taxonomies that represent 90% of the total `COST\_USD`

		COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MACRO_TAXO	TAXONOMY				
MCF	MCF/LWAL+CDL+DUL/HEX:2/RES	\$11,005.2M	64,040	12.25%	9.71%
MR	MR/LWAL+CDL+DUL/HEX:2/RES	\$9,316.7M	54,214	10.37%	8.22%
MCF	MCF/LWAL+CDL+DUL/HEX:1/RES	\$5,126.8M	53,700	5.71%	8.14%
	MCF/LWAL+CDM+DUM/HEX:2/RES	\$4,690.3M	27,293	5.22%	4.14%
S	S+SR/LFBR+CDL+DUL/HBET:12,24/COM	\$3,843.0M	907	4.28%	0.14%
MR	MR/LWAL+CDM+DUM/HEX:2/RES	\$3,677.1M	21,397	4.09%	3.24%
MUR	MUR/LWAL+DNO/HEX:2/RES	\$3,032.2M	78,644	3.38%	11.92%
MR	MR/LWAL+CDM+DUM/HEX:1/RES	\$2,987.0M	31,287	3.33%	4.74%
	MR/LWAL+CDL+DUL/HEX:1/RES	\$2,826.5M	59,211	3.15%	8.98%
MCF	MCF/LWAL+CDL+DUL/HEX:1/IND	\$2,576.1M	2,004	2.87%	0.30%
	MCF/LWAL+CDM+DUM/HEX:1/RES	\$2,536.7M	26,570	2.82%	4.03%
RC	CR/LFINF+CDM+DUM/HEX:2/RES	\$2,516.2M	14,642	2.80%	2.22%
MCF	MCF/LWAL+CDL+DUL/HEX:2/COM	\$2,397.7M	9,620	2.67%	1.46%
MUR	MUR/LWAL+DNO/HEX:1/RES	\$2,235.8M	86,982	2.49%	13.19%
RC	CR/LDUAL+CDH+DUH/HEX:7/RES	\$2,197.7M	240	2.45%	0.04%
	CR/LDUAL+CDH+DUH/HBET:12,24/RES	\$2,180.6M	127	2.43%	0.02%
MR	CR/LDUAL+CDH+DUH/HEX:12/RES	\$2,156.5M	157	2.40%	0.02%
	CR/LFM+CDL+DUL/HEX:1/IND	\$2,098.5M	1,335	2.34%	0.20%
MR	MR/LWAL+CDL+DUL/HEX:3/RES	\$2,005.5M	10,451	2.23%	1.58%
S	S+SR/LFINF+CDL+DUL/HEX:1/IND	\$1,923.3M	1,360	2.14%	0.21%
	S+SR/LFM+CDL+DUL/HEX:1/IND	\$1,923.3M	1,360	2.14%	0.21%
RC	CR/LFM+CDL+DUL/HEX:3/COM	\$1,821.1M	3,491	2.03%	0.53%
W	W+WS/LPB+CDL+DUL/HEX:1/RES	\$1,795.6M	69,858	2.00%	10.59%
MCF	MCF/LWAL+CDL+DUL/HEX:3/RES	\$1,779.5M	9,273	1.98%	1.41%
	MCF/LWAL+CDM+DUM/HEX:3/RES	\$1,769.7M	9,222	1.97%	1.40%
MR	MR/LWAL+CDM+DUM/HEX:3/RES	\$1,769.7M	9,222	1.97%	1.40%
RC	CR/LFM+CDL+DUL/HEX:7/COM	\$1,249.5M	1,160	1.39%	0.18%
MCF	MCF/LWAL+CDL+DUL/HEX:3/COM	\$1,157.3M	2,400	1.29%	0.36%
RC	CR/LDUAL+CDL+DUL/HBET:12,24/COM	\$1,143.0M	293	1.27%	0.04%
	CR/LDUAL+CDL+DUL/HEX:7/COM	\$1,068.6M	994	1.19%	0.15%
	CR+PCPS/LFM+CDL+DUL/HEX:1/IND	\$1,046.4M	665	1.16%	0.10%
	CR/LFINF+CDM+DUM/HEX:6/RES	\$1,019.6M	712	1.14%	0.11%
S	S+SR/LFM+CDL+DUL/HEX:1/COM	\$955.5M	6,871	1.06%	1.04%

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