

# 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 = "Nicaragua"
```

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

## Sanity checks and formats

**Nicaragua**  
Exposure/Exposure/Exposure\_Com\_Nicaragua.csv  
Exposure/Exposure/Exposure\_Ind\_Nicaragua.csv  
Exposure/Exposure/Exposure\_Res\_Nicaragua.csv  
Occupants / Dwellings = 5.2  
No refence household size data available  
Population (exposure / UN\_2021) = 0.92  
WARNING: ADM\_1 with empty values:  
OCCUPANCY Com Ind Res  
ID\_1  
10 NaN NaN Lago Nicaragua  
Exposure models OK

## Exposure at National level

### Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	6.1M	1,106.1K	\$70.5B	88.75%	81.55%
Ind	0.0M	31.7K	\$6.5B	2.54%	7.58%
Com	0.0M	108.6K	\$9.4B	8.71%	10.87%

### Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	113.2M	\$63,072.5M	91	\$763
Res	87.9M	\$53,600.9M	80	\$801
Ind	11.4M	\$3,646.6M	360	\$575
Com	13.9M	\$5,825.0M	128	\$677

## Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Managua	\$27,426.4M	314.1K	1,510.3K	31.74%	25.20%	24.60%
León	\$7,368.4M	92.7K	425.3K	8.53%	7.44%	6.93%
Chinandega	\$7,243.5M	96.6K	453.0K	8.38%	7.75%	7.38%
Matagalpa	\$7,185.8M	116.9K	598.8K	8.32%	9.38%	9.76%
Masaya	\$4,873.8M	71.2K	346.6K	5.64%	5.71%	5.65%
Jinotega	\$4,103.1M	77.6K	415.5K	4.75%	6.23%	6.77%
Estelí	\$4,000.0M	53.0K	240.9K	4.63%	4.25%	3.92%
Atlántico Sur	\$3,361.6M	61.0K	320.4K	3.89%	4.90%	5.22%
Atlántico Norte	\$2,878.2M	64.5K	375.3K	3.33%	5.17%	6.11%
Nueva Segovia	\$2,644.3M	49.7K	229.7K	3.06%	3.99%	3.74%
Chontales	\$2,576.9M	37.6K	183.8K	2.98%	3.02%	2.99%
Rivas	\$2,359.0M	32.4K	148.2K	2.73%	2.60%	2.41%
Carazo	\$2,215.1M	41.4K	198.4K	2.56%	3.32%	3.23%
Lago Nicaragua	\$2,147.9M	29.0K	164.4K	2.49%	2.33%	2.68%
Boaco	\$2,005.5M	35.8K	180.1K	2.32%	2.87%	2.93%
Madriz	\$1,724.0M	31.9K	158.3K	1.99%	2.56%	2.58%
Granada	\$1,308.8M	18.9K	75.3K	1.51%	1.52%	1.23%
Rio San Juan	\$994.6M	22.1K	114.2K	1.15%	1.78%	1.86%

## Exposure by simplified taxonomy

Adding `MACRO\_TAXO` column

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
MCF	\$29,839.5M	175.3K	824.9K	34.53%	14.06%	13.44%
W	\$17,291.8M	450.1K	2,280.7K	20.01%	36.11%	37.15%
MR	\$11,904.6M	76.6K	474.3K	13.78%	6.15%	7.73%
MUR	\$11,150.4M	278.0K	1,463.0K	12.90%	22.31%	23.83%
S	\$6,303.4M	62.8K	0.0K	7.29%	5.04%	0.00%
RC	\$5,699.0M	84.2K	476.4K	6.59%	6.75%	7.76%
ADO/E	\$2,572.7M	71.4K	371.2K	2.98%	5.73%	6.05%
OT	\$1,655.5M	48.0K	248.0K	1.92%	3.85%	4.04%

## 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	\$11,416.1M	51,516	14.70%	4.41%
W	W+WS/LPB+CDL+DUL/HEX:1/RES	\$10,957.5M	317,598	14.11%	27.21%
MCF	MCF/LWAL+CDL+DUL/HEX:1/RES	\$6,055.4M	49,185	7.80%	4.21%
MUR	MUR/LWAL+DNO/HEX:1/RES	\$5,549.0M	160,841	7.14%	13.78%
MR	MR/LWAL+CDL+DUL/HEX:2/RES	\$5,466.2M	24,664	7.04%	2.11%
MCF	MCF/LWAL+CDL+DUL/HEX:3/RES	\$3,000.6M	12,127	3.86%	1.04%
MUR	MUR/LWAL+DNO/HEX:2/RES	\$2,979.5M	57,573	3.84%	4.93%
ADO/E	MUR+ADO/LWAL+DNO/HEX:1/RES	\$2,248.3M	65,160	2.89%	5.58%
MR	MR/LWAL+CDL+DUL/HEX:1/RES	\$2,170.8M	31,459	2.79%	2.69%
MUR	MUR+ST/LWAL+DNO/HEX:1/RES	\$1,847.9M	44,630	2.38%	3.82%
MCF	MCF/LWAL+CDM+DUM/HEX:2/RES	\$1,779.8M	8,032	2.29%	0.69%
OT	UNK/UNK+DNO/HEX:1/RES	\$1,655.5M	47,986	2.13%	4.11%
W	W+WLI/LWAL+CDL+DUL/HEX:1/COM	\$1,643.7M	20,923	2.12%	1.79%
MCF	MCF/LWAL+CDL+DUL/HEX:1/IND	\$1,585.3M	9,132	2.04%	0.78%
MR	MR/LWAL+CDL+DUL/HEX:3/RES	\$1,578.1M	6,374	2.03%	0.55%
MCF	MCF/LWAL+CDL+DUL/HEX:2/COM	\$1,521.7M	12,306	1.96%	1.05%
MR	MR/LWAL+CDM+DUM/HEX:2/RES	\$1,430.8M	6,459	1.84%	0.55%
RC	CR/LFM+CDL+DUL/HEX:1/RES	\$1,283.4M	37,196	1.65%	3.19%
W	W+WBB/LPB+CDL+DUL/HEX:1/RES	\$1,133.8M	32,871	1.46%	2.82%
MCF	MCF/LWAL+CDM+DUM/HEX:1/RES	\$1,124.9M	9,141	1.45%	0.78%
RC	CR/LFM+CDL+DUL/HEX:2/RES	\$1,101.1M	17,739	1.42%	1.52%
W	W+WWD/LWAL+CDL+DUL/HEX:1/RES	\$1,056.6M	30,628	1.36%	2.62%
RC	CR+PCPS/LFM+CDL+DUL/HEX:1/IND	\$967.5M	4,565	1.25%	0.39%
W	W+WLI/LWAL+CDL+DUL/HEX:1/RES	\$939.8M	27,237	1.21%	2.33%
MCF	MCF/LWAL+CDM+DUM/HEX:3/RES	\$890.0M	3,591	1.15%	0.31%
S	S+SR/LFINF+CDL+DUL/HEX:1/IND	\$879.6M	4,565	1.13%	0.39%
	S+SR/LFM+CDL+DUL/HEX:1/IND	\$879.6M	4,565	1.13%	0.39%
	S+SR/LFINF+CDL+DUL/HEX:1/COM	\$860.8M	12,943	1.11%	1.11%
	S+SR/LFM+CDL+DUL/HEX:1/COM	\$860.2M	12,935	1.11%	1.11%
MUR	MUR+ST/LWAL+DNO/HEX:2/RES	\$774.1M	14,953	1.00%	1.28%
S	S+SL/LFM+CDL+DUL/HEX:1/COM	\$771.4M	10,989	0.99%	0.94%
W	W+WLI/LWAL+CDL+DUL/HEX:2/RES	\$636.8M	12,303	0.82%	1.05%
MR	MR/LWAL+CDM+DUM/HEX:1/RES	\$633.0M	5,139	0.81%	0.44%

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