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 S
hapely GEOS version (3.9.1-CAPI-1.14.2) is incompatible with the GEOS version PyGEOS was compil
ed with (3.10.1-CAPI-1.16.0). Conversions between both will be slow.
  warnings.warn(
```

```
# Parameters
country = "Guatemala"
```

```
Exposure files:
  Exposure_Com_Guatemala.csv
  Exposure_Ind_Guatemala.csv
  Exposure_Res_Guatemala.csv
```

Sanity checks and formats

Guatemala
  Exposure/Exposure/Exposure_Com_Guatemala.csv
  Exposure/Exposure/Exposure_Ind_Guatemala.csv
  Exposure/Exposure/Exposure_Res_Guatemala.csv
  Occupants / Dwellings = 4.8
  Reference avg household size (2019) = 4.8
  Population (exposure / UN_2021) = 0.91
  Exposure models OK

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	16.6M	2,900.6K	$187.4B	95.52%	81.22%
Ind	0.0M	33.1K	$18.6B	1.09%	8.06%
Com	0.0M	102.8K	$24.7B	3.39%	10.72%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	431.4M	$171.4B	142	$535
Res	376.9M	$143.9B	130	$497
Ind	23.4M	$10.9B	709	$793
Com	31.0M	$16.6B	302	$797

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Guatemala	$88,675.6M	701.3K	3,751.4K	38.44%	23.10%	22.63%
Quezaltenango	$14,550.3M	171.3K	947.1K	6.31%	5.64%	5.71%
Escuintla	$13,851.8M	150.5K	794.7K	6.00%	4.95%	4.79%
San Marcos	$11,421.2M	210.2K	1,172.3K	4.95%	6.92%	7.07%
Huehuetenango	$10,081.1M	235.3K	1,248.6K	4.37%	7.75%	7.53%
Chimaltenango	$8,720.3M	108.1K	658.0K	3.78%	3.56%	3.97%
Alta Verapaz	$8,209.1M	187.2K	1,182.4K	3.56%	6.16%	7.13%
SacatepÃ©quez	$7,542.3M	64.0K	365.7K	3.27%	2.11%	2.21%
SuchitepÃ©quez	$6,992.6M	96.8K	534.5K	3.03%	3.19%	3.22%
Jutiapa	$6,263.9M	114.5K	574.1K	2.72%	3.77%	3.46%
Izabal	$6,261.9M	91.4K	463.8K	2.71%	3.01%	2.80%
Santa Rosa	$6,047.4M	88.8K	444.5K	2.62%	2.92%	2.68%
QuichÃ©	$5,777.0M	164.0K	929.8K	2.50%	5.40%	5.61%
PetÃ©n	$5,219.7M	98.8K	540.8K	2.26%	3.25%	3.26%
Retalhuleu	$5,030.2M	70.7K	391.3K	2.18%	2.33%	2.36%
SololÃ¡	$4,816.0M	75.4K	453.5K	2.09%	2.48%	2.74%
Chiquimula	$4,300.0M	84.5K	446.1K	1.86%	2.78%	2.69%
Zacapa	$4,198.6M	60.1K	295.2K	1.82%	1.98%	1.78%
TotonicapÃ¡n	$3,982.7M	89.7K	500.5K	1.73%	2.95%	3.02%
El Progreso	$3,093.0M	43.6K	205.8K	1.34%	1.44%	1.24%
Jalapa	$2,941.6M	65.8K	358.5K	1.28%	2.17%	2.16%
Baja Verapaz	$2,722.6M	64.4K	318.5K	1.18%	2.12%	1.92%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MCF	$138,251.0M	674.9K	3,405.5K	59.93%	22.23%	20.54%
MR	$30,234.0M	199.9K	1,227.0K	13.11%	6.58%	7.40%
W	$19,716.7M	745.1K	4,142.2K	8.55%	24.54%	24.99%
ADO/E	$16,425.3M	748.6K	4,020.9K	7.12%	24.65%	24.26%
MUR	$14,322.9M	564.9K	2,967.5K	6.21%	18.60%	17.90%
RC	$6,793.9M	31.7K	486.2K	2.94%	1.04%	2.93%
S	$3,677.0M	8.5K	0.0K	1.59%	0.28%	0.00%
OT	$1,278.0M	63.0K	327.8K	0.55%	2.07%	1.98%

Exposure by taxonomy

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

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MCF	MCF/LWAL+CDL+DUL/HEX:2/RES	$46,178.6M	197,627	22.26%	6.84%
	MCF/LWAL+CDL+DUL/HEX:1/RES	$27,751.7M	213,780	13.38%	7.40%
MR	MR/LWAL+CDL+DUL/HEX:2/RES	$13,669.7M	58,501	6.59%	2.02%
ADO/E	MUR+ADO/LWAL+DNO/HEX:1/RES	$12,700.1M	626,129	6.12%	21.66%
MCF	MCF/LWAL+CDL+DUL/HEX:2/RES	$12,130.6M	51,914	5.85%	1.80%
MUR	MUR/LWAL+DNO/HEX:2/RES	$8,593.7M	282,455	4.14%	9.77%
	MCF/LWAL+CDL+DUM/HEX:1/RES	$8,389.8M	64,630	4.04%	2.24%
MCF	MCF/LWAL+CDL+DUL/HEX:3/RES	$7,230.1M	27,709	3.49%	0.96%
	MCF/LWAL+CDL+DUL/HEX:2/COM	$6,931.9M	24,887	3.34%	0.86%
W	W+WS/LPB+CDL+DUL/HEX:1/RES	$6,333.7M	312,258	3.05%	10.80%
MUR	MUR/LWAL+DNO/HEX:1/RES	$5,729.2M	282,455	2.76%	9.77%
MR	MR/LWAL+CDM+DUM/HEX:2/RES	$5,299.5M	22,680	2.55%	0.78%
MCF	MCF/LWAL+CDL+DUL/HEX:2/IND	$5,200.9M	7,457	2.51%	0.26%
MR	MR/LWAL+CDM+DUM/HEX:1/RES	$4,215.6M	32,474	2.03%	1.12%
MCF	MCF/LWAL+CDL+DUL/HEX:1/IND	$3,725.6M	11,194	1.80%	0.39%
ADO/E	MUR+ADO/LWAL+DNO/HEX:2/RES	$3,725.2M	122,438	1.80%	4.24%
MCF	MCF/LWAL+CDM+DUM/HEX:2/COM	$3,456.6M	12,425	1.67%	0.43%
MR	MR/LWAL+CDL+DUL/HEX:1/RES	$2,844.1M	70,108	1.37%	2.43%
W	W+WLI/LWAL+CDL+DUL/HEX:2/RES	$2,766.8M	90,937	1.33%	3.15%
MCF	MCF/LWAL+CDM+DUM/HEX:2/IND	$2,598.2M	3,731	1.25%	0.13%
	MCF/LWAL+CDM+DUM/HEX:3/RES	$2,596.3M	9,950	1.25%	0.34%
W	W+WLI/LWAL+CDL+DUL/HEX:1/RES	$2,559.5M	126,186	1.23%	4.37%
MCF	MCF/LWAL+CDL+DUL/HEX:3/COM	$2,465.5M	5,508	1.19%	0.19%
W	W+WBB/LPB+CDL+DUL/HEX:1/RES	$2,108.5M	103,950	1.02%	3.60%
MR	MR/LWAL+CDM+DUM/HEX:3/RES	$2,102.5M	8,058	1.01%	0.28%
	MR/LWAL+CDM+DUM/HEX:3/RES	$2,102.5M	8,058	1.01%	0.28%
MCF	MCF/LWAL+CDL+DUL/HEX:1/COM	$2,094.0M	16,591	1.01%	0.57%
W	W+WWD/LWAL+CDL+DUL/HEX:1/RES	$1,960.9M	96,673	0.95%	3.34%