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 = "Haiti"
```

```
Exposure files:
  Exposure_Com_Haiti.csv
  Exposure_Ind_Haiti.csv
  Exposure_Res_Haiti.csv
```

Sanity checks and formats

```
  Haiti
   Exposure/Exposure/Exposure_Com_Haiti.csv
   Exposure/Exposure/Exposure_Ind_Haiti.csv
   Exposure/Exposure/Exposure_Res_Haiti.csv
   Occupants / Dwellings = 4.7
   Reference avg household size (2019) = 4.3
   Population (exposure / UN_2021) = 0.89
  Exposure models  OK
```

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	10.3M	2,061.9K	$52,628.8M	92.54%	88.12%
Ind	0.0M	27.9K	$691.9M	1.25%	1.16%
Com	0.0M	138.3K	$6,402.1M	6.21%	10.72%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	190,774.6K	$46,793.2M	86	$313
Res	172,563.6K	$42,273.5M	84	$305
Ind	1,976.3K	$382.7M	71	$350
Com	16,234.7K	$4,137.0M	117	$394

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Ouest	$24,469.6M	819.7K	3,910.3K	40.97%	36.79%	38.00%
L'Artibonite	$9,160.2M	350.6K	1,606.3K	15.34%	15.74%	15.61%
Nord	$5,609.2M	217.0K	991.1K	9.39%	9.74%	9.63%
Sud	$4,526.9M	193.6K	865.5K	7.58%	8.69%	8.41%
Centre	$3,864.4M	155.8K	703.6K	6.47%	6.99%	6.84%
Nord-Ouest	$3,695.9M	142.1K	649.3K	6.19%	6.38%	6.31%
Sud-Est	$2,914.4M	118.5K	533.7K	4.88%	5.32%	5.19%
Grand'Anse	$2,171.8M	94.1K	417.6K	3.64%	4.22%	4.06%
Nord-Est	$1,755.2M	69.9K	317.1K	2.94%	3.14%	3.08%
Nippes	$1,555.2M	66.7K	296.6K	2.60%	2.99%	2.88%

Exposure by simplified taxonomy

```
Adding `MACRO_TAXO` column
```

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MUR	$18,124.5M	801.8K	3,846.2K	30.35%	35.98%	37.37%
OT	$10,603.1M	500.3K	2,316.2K	17.75%	22.45%	22.51%
RC	$8,672.2M	244.3K	1,400.1K	14.52%	10.97%	13.61%
ADO/E	$6,592.2M	297.5K	1,377.5K	11.04%	13.35%	13.39%
MCF	$6,137.6M	138.7K	410.4K	10.28%	6.22%	3.99%
S	$3,351.8M	22.8K	0.0K	5.61%	1.02%	0.00%
W	$3,321.3M	167.1K	625.8K	5.56%	7.50%	6.08%
MR	$2,920.0M	55.7K	314.9K	4.89%	2.50%	3.06%

Exposure by taxonomy

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

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MUR	MUR/LWAL+DNO/HEX:1/RES	$12,884.9M	607,916	24.04%	30.05%
OT	UNK/UNK+DNO/HEX:1/RES	$10,603.1M	500,257	19.79%	24.73%
ADO/E	MUR+ADO/LWAL+DNO/HEX:1/RES	$5,730.5M	270,367	10.69%	13.37%
MUR	MUR+ST/LWAL+DNO/HEX:1/RES	$3,683.6M	144,904	6.87%	7.16%
MCF	MCF/LWAL+CDL+DUL/HEX:1/RES	$3,112.0M	70,792	5.81%	3.50%
RC	CR/LFINF+CDL+DUL/HEX:2/RES	$2,562.6M	67,184	4.78%	3.32%
	CR/LFINF+CDL+DUL/HEX:3/RES	$2,277.6M	53,033	4.25%	2.62%
W	W+WWD/LWAL+CDL+DUL/HEX:1/RES	$1,744.0M	82,282	3.25%	4.07%
S	S+SR/LFINF+CDM+DUM/HEX:1/COM	$1,623.2M	4,220	3.03%	0.21%
MUR	MUR/LWAL+DNO/HEX:2/RES	$1,556.0M	48,942	2.90%	2.42%
MR	MR/LWAL+CDL+DUL/HEX:2/RES	$1,257.3M	16,115	2.35%	0.80%
RC	CR/LFM+CDL+DUL/HEX:1/RES	$1,029.9M	48,590	1.92%	2.40%
MCF	MCF/LWAL+CDL+DUL/HEX:1/COM	$1,022.9M	34,289	1.91%	1.70%
S	S+SR/LFM+CDM+DUM/HEX:1/COM	$991.6M	2,578	1.85%	0.13%
RC	CR/LFINF+CDL+DUL/HEX:4/RES	$987.3M	4,668	1.84%	0.23%
MR	MR/LWAL+CDL+DUL/HEX:1/RES	$872.5M	30,873	1.63%	1.53%
ADO/E	MUR+ADO/LWAL+DNO/HEX:2/RES	$861.7M	27,104	1.61%	1.34%
MR	MR/LWAL+CDL+DUL/HEX:3/RES	$790.2M	8,749	1.47%	0.43%