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(
```

```python
# Parameters
country = "Lesotho"
```

```
Exposure files:
   Exposure_Com_Lesotho.csv
   Exposure_Ind_Lesotho.csv
   Exposure_Res_Lesotho.csv
```

Sanity checks and formats

```
Lesotho
   Exposure/Exposure/Exposure_Com_Lesotho.csv
   Exposure/Exposure/Exposure_Ind_Lesotho.csv
   Exposure/Exposure/Exposure_Res_Lesotho.csv
   Occupants / Dwellings = 3.7
   Reference avg household size (2019) = 3.52
   Population (exposure / UN_2021) = 0.99
   Exposure models  OK
```

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	2,141.9K	538,282	$6,963.8M	98.02%	93.33%
Ind	0.0K	2,430	$135.0M	0.44%	1.81%
Com	0.0K	8,461	$363.0M	1.54%	4.87%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	47,761.3K	$6,512.1M	87	$156
Res	45,534.6K	$6,151.5M	85	$153
Ind	674.3K	$89.1M	278	$200
Com	1,552.3K	$271.5M	183	$234

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Maseru District	$1,837.9M	135.1K	526.8K	24.63%	24.60%	24.59%
Berea District	$1,118.6M	82.3K	320.8K	14.99%	14.98%	14.98%
Leribe District	$1,098.8M	80.8K	315.2K	14.73%	14.72%	14.71%
Mafeteng District	$663.1M	48.8K	190.4K	8.89%	8.89%	8.89%
Mohale's Hoek District	$619.4M	45.6K	177.9K	8.30%	8.30%	8.30%
Thaba-Tseka District	$485.9M	35.8K	139.6K	6.51%	6.52%	6.52%
Mokhotlong District	$464.4M	34.2K	133.5K	6.22%	6.23%	6.23%
Quthing District	$464.2M	34.2K	133.4K	6.22%	6.23%	6.23%
Butha-Buthe District	$434.3M	32.0K	124.9K	5.82%	5.83%	5.83%
Qacha's Nek District	$275.1M	20.3K	79.3K	3.69%	3.70%	3.70%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MUR	$5,993.2M	457,932	1,789.6K	80.32%	83.39%	83.56%
ADO/E	$458.5M	36,680	149.6K	6.14%	6.68%	6.99%
RC	$432.9M	12,867	52.2K	5.80%	2.34%	2.44%
MCF	$356.5M	15,928	52.1K	4.78%	2.90%	2.43%
W	$144.2M	17,031	70.1K	1.93%	3.10%	3.27%
S	$47.8M	600	0.0K	0.64%	0.11%	0.00%
OT	$28.6M	8,135	28.1K	0.38%	1.48%	1.31%

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+CB/LWAL+CDN/H:2/RES	$1,819.6M	114,764	27.25%	22.01%
	MUR+CB/LWAL+CDN/H:1/RES	$1,104.9M	117,708	16.55%	22.57%
	MUR+STRUB/LWAL+CDN/H:2/RES	$1,083.4M	85,412	16.23%	16.38%
	MUR+STRUB/LWAL+CDN/H:1/RES	$657.9M	87,602	9.85%	16.80%
ADO/E	MUR+ADO/LWAL+CDN/H:2/RES	$250.2M	17,535	3.75%	3.36%
MUR	MUR+CB/LWAL+CDN/HBET:3-6/RES	$240.6M	1,544	3.60%	0.30%
	MUR+CL/LWAL+CDN/H:2/RES	$170.8M	10,771	2.56%	2.07%
RC	CR/LFINF+CDL/H:3/RES	$163.3M	4,747	2.45%	0.91%
MCF	MCF+CB/LWAL+CDL/H:2/RES	$160.0M	6,726	2.40%	1.29%
ADO/E	MUR+ADO/LWAL+CDN/H:1/RES	$151.9M	17,983	2.28%	3.45%
MUR	MUR+STDRE/LWAL+CDN/H:2/RES	$144.1M	9,087	2.16%	1.74%
	MUR+STRUB/LWAL+CDN/HBET:3-6/RES	$143.2M	1,154	2.15%	0.22%
RC	CR/LFINF+CDL/H:2/RES	$132.9M	5,938	1.99%	1.14%
MUR	MUR+CL/LWAL+CDN/H:1/RES	$103.7M	11,047	1.55%	2.12%
MCF	MCF+CB/LWAL+CDL/H:1/RES	$97.2M	6,900	1.46%	1.32%
MUR	MUR+STDRE/LWAL+CDN/H:1/RES	$87.5M	9,319	1.31%	1.79%
W	W+WWD/LWAL+CDN/H:1/RES	$84.6M	12,012	1.27%	2.30%
MUR	MUR+CB/LWAL+CDN/H:2/COM	$80.9M	1,223	1.21%	0.23%