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 = "Senegal"
```

```
Exposure files:
  Exposure_Com_Senegal.csv
  Exposure_Ind_Senegal.csv
  Exposure_Res_Senegal.csv
```

Sanity checks and formats

Senegal
```
  Exposure/Exposure/Exposure_Com_Senegal.csv
  Exposure/Exposure/Exposure_Ind_Senegal.csv
  Exposure/Exposure/Exposure_Res_Senegal.csv
  Occupants / Dwellings = 8.7
  Reference avg household size (2019) = 8.68
  Population (exposure / UN_2021) = 0.97
Exposure models  OK
```

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	16.7M	1,769.8K	$48,102.4M	95.55%	85.15%
Ind	0.0M	15.0K	$1,788.2M	0.81%	3.17%
Com	0.0M	67.5K	$6,598.2M	3.64%	11.68%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	168,980.0K	$47,730.7M	91	$334
Res	151,540.2K	$41,682.5M	86	$317
Ind	4,258.3K	$1,161.4M	285	$420
Com	13,181.5K	$4,886.9M	195	$501

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Dakar	$13,018.3M	426.6K	3,847.0K	23.05%	23.03%	23.03%
Thies	$7,433.0M	243.6K	2,196.9K	13.16%	13.15%	13.15%
Diourbel	$6,292.1M	206.2K	1,859.8K	11.14%	11.13%	11.13%
Kaolack	$4,023.9M	131.9K	1,189.9K	7.12%	7.12%	7.12%
Saint Louis	$3,772.8M	123.7K	1,115.6K	6.68%	6.68%	6.68%
Louga	$3,712.4M	121.7K	1,097.8K	6.57%	6.57%	6.57%
Fatick	$3,027.8M	99.3K	895.3K	5.36%	5.36%	5.36%
Tambacounda	$2,869.5M	94.1K	848.6K	5.08%	5.08%	5.08%
Kolda	$2,780.2M	91.2K	822.6K	4.92%	4.92%	4.92%
Kaffrine	$2,385.2M	78.3K	705.8K	4.22%	4.22%	4.23%
Matam	$2,347.6M	77.0K	694.6K	4.16%	4.16%	4.16%
Ziguinchor	$2,284.8M	75.0K	676.1K	4.04%	4.05%	4.05%
Sedhiou	$1,911.3M	62.7K	565.8K	3.38%	3.39%	3.39%
Kedougou	$629.9M	20.8K	187.5K	1.12%	1.12%	1.12%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MUR	$33,331.9M	1,164,519	10,242.5K	59.01%	62.87%	61.32%
RC	$9,472.5M	138,680	1,552.7K	16.77%	7.49%	9.30%
ADO/E	$6,463.6M	368,303	3,323.3K	11.44%	19.88%	19.90%
MCF	$5,863.0M	130,769	1,176.2K	10.38%	7.06%	7.04%
W	$631.0M	23,199	203.5K	1.12%	1.25%	1.22%
S	$573.8M	3,737	0.0K	1.02%	0.20%	0.00%
OT	$153.1M	23,058	205.0K	0.27%	1.24%	1.23%

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	$15,100.0M	504,986	29.71%	28.64%
	MUR+CB/LWAL+CDN/H:1/RES	$9,169.0M	517,937	18.04%	29.37%
ADO/E	MUR+ADO/LWAL+CDN/H:2/RES	$2,747.9M	102,107	5.41%	5.79%
MCF	MCF+CB/LWAL+CDL/H:2/RES	$2,622.3M	58,466	5.16%	3.32%
RC	CR/LFINF+CDL/H:3/RES	$2,456.4M	37,855	4.83%	2.15%
	CR/LFINF+CDL/H:2/RES	$1,999.4M	47,365	3.93%	2.69%
MUR	MUR+CB/LWAL+CDN/HBET:3-6/RES	$1,996.3M	6,816	3.93%	0.39%
	MUR+CB/LWAL+CDN/H:2/COM	$1,814.1M	14,569	3.57%	0.83%
	MUR+CB/LWAL+CDN/H:1/COM	$1,766.9M	29,141	3.48%	1.65%
ADO/E	MUR+ADO/LWAL+CDN/H:1/RES	$1,668.6M	104,723	3.28%	5.94%
MCF	MCF+CB/LWAL+CDL/H:1/RES	$1,592.3M	59,964	3.13%	3.40%
MUR	MUR+CL/LWAL+CDN/H:2/RES	$1,137.1M	38,027	2.24%	2.16%
RC	CR/LFINF+CDL/HBET:4-7/RES	$1,096.0M	1,734	2.16%	0.10%
ADO/E	EWV/LN+CDN/H:1/RES	$997.2M	150,210	1.96%	8.52%
RC	CR/LWAL+CDL/H:3/RES	$786.1M	12,115	1.55%	0.69%
MCF	MCF+CB/LWAL+CDL/HBET:3-6/RES	$731.9M	1,668	1.44%	0.09%
MUR	MUR+CL/LWAL+CDN/H:1/RES	$690.5M	39,000	1.36%	2.21%
RC	CR/LWAL+CDL/H:2/RES	$639.9M	15,156	1.26%	0.86%
MUR	MUR+CB/LWAL+CDN/H:1/IND	$408.7M	5,371	0.80%	0.30%
ADO/E	MUR+ADO/LWAL+CDN/HBET:3-6/RES	$363.0M	1,374	0.71%	0.08%
	CR/LWAL+CDL/HBET:4-7/RES	$350.8M	554	0.69%	0.03%
RC	CR/LFINF+CDL/H:1/RES	$346.9M	13,879	0.68%	0.79%
	CR/LFINF+CDL/HBET:8+/RES	$342.5M	434	0.67%	0.02%