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 = "Tunisia"
```

Exposure files:
    Exposure_Com_Tunisia.csv
    Exposure_Ind_Tunisia.csv
    Exposure_Res_Tunisia.csv

Sanity checks and formats

Tunisia
    Exposure/Exposure/Exposure_Com_Tunisia.csv
    Exposure/Exposure/Exposure_Ind_Tunisia.csv
    Exposure/Exposure/Exposure_Res_Tunisia.csv
    Occupants / Dwellings = 3.9
    Reference avg household size (2019) = 3.9
    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	11.8M	2,698.7K	$71.7B	93.34%	78.58%
Ind	0.0M	87.6K	$9.5B	3.03%	10.36%
Com	0.0M	105.1K	$10.1B	3.63%	11.05%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	294.2M	$69.8B	102	$310
Res	246.6M	$57.5B	91	$291
Ind	25.0M	$5.4B	285	$379
Com	22.7M	$6.8B	216	$445

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Sfax	$7,901.2M	250.1K	1,018.4K	8.65%	8.65%	8.65%
Tunis	$7,764.8M	245.8K	1,000.8K	8.50%	8.50%	8.50%
Nabeul	$6,563.5M	207.8K	846.0K	7.19%	7.19%	7.19%
Ariana	$6,192.0M	196.0K	798.1K	6.78%	6.78%	6.78%
Sousse	$6,112.5M	193.5K	787.8K	6.69%	6.69%	6.69%
Ben Arous	$5,290.8M	167.5K	681.9K	5.79%	5.79%	5.79%
Monastir	$4,744.5M	150.2K	611.6K	5.20%	5.20%	5.20%
Bizerte	$4,644.0M	147.0K	598.7K	5.09%	5.09%	5.09%
Kairouan	$4,482.6M	141.9K	577.9K	4.91%	4.91%	4.91%
M�denine	$3,965.2M	125.6K	511.2K	4.34%	4.34%	4.34%
Manouba	$3,706.6M	117.4K	478.0K	4.06%	4.06%	4.06%
Kasserine	$3,545.3M	112.3K	457.2K	3.88%	3.88%	3.88%
Sidi Bouzid	$3,520.3M	111.5K	454.0K	3.86%	3.86%	3.86%
Mahdia	$3,232.4M	102.4K	416.9K	3.54%	3.54%	3.54%
Gab�s	$3,074.2M	97.4K	396.5K	3.37%	3.37%	3.37%
Jendouba	$3,059.1M	96.9K	394.5K	3.35%	3.35%	3.35%
Gafsa	$2,699.4M	85.5K	348.2K	2.96%	2.96%	2.96%
B�ja	$2,379.2M	75.4K	306.9K	2.61%	2.61%	2.61%
El Kef	$1,834.1M	58.1K	236.8K	2.01%	2.01%	2.01%
Siliana	$1,695.3M	53.8K	218.9K	1.86%	1.86%	1.86%
Zaghouan	$1,520.4M	48.2K	196.4K	1.67%	1.67%	1.67%
K�bili	$1,289.6M	40.9K	166.5K	1.41%	1.42%	1.41%
Tataouine	$1,193.7M	37.9K	154.1K	1.31%	1.31%	1.31%
Tozeur	$892.2M	28.3K	115.4K	0.98%	0.98%	0.98%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
RC	$33,456.3M	573.7K	2,785.8K	36.64%	19.84%	23.66%
MUR	$31,167.2M	1,310.7K	5,097.1K	34.14%	45.33%	43.30%
MCF	$13,708.3M	355.5K	1,392.9K	15.01%	12.30%	11.83%
ADO/E	$8,236.1M	499.3K	1,990.0K	9.02%	17.27%	16.90%
S	$2,824.2M	21.9K	0.0K	3.09%	0.76%	0.00%
W	$1,452.4M	46.2K	176.6K	1.59%	1.60%	1.50%
OT	$458.7M	84.1K	330.1K	0.50%	2.91%	2.80%

Exposure by taxonomy

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

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
RC	CR/LFINF+CDL/H:3/RES	$6,693.4M	125,989	8.17%	4.69%
MCF	MCF/LWAL+CDL/H:2/RES	$5,977.3M	162,156	7.30%	6.04%
MUR	MUR+CB/LWAL+CDN/H:2/RES	$5,854.0M	239,983	7.15%	8.94%
	MUR+CL/LWAL+CDN/H:2/RES	$5,854.0M	239,983	7.15%	8.94%
RC	CR/LFINF+CDL/H:2/RES	$5,448.1M	157,655	6.65%	5.87%
MCF	MCF/LWAL+CDL/H:1/RES	$3,629.5M	166,315	4.43%	6.19%
MUR	MUR+CB/LWAL+CDN/H:1/RES	$3,554.7M	246,139	4.34%	9.17%
	MUR+CL/LWAL+CDN/H:1/RES	$3,554.7M	246,139	4.34%	9.17%
RC	CR/LFINF+CDL/HBET:4-7/RES	$2,986.4M	5,775	3.65%	0.22%
ADO/E	E+ETO/LWAL+CDL/H:1/RES	$2,688.9M	246,425	3.28%	9.18%
RC	CR/LDUAL+CDL/H:3/RES	$2,677.4M	50,354	3.27%	1.88%
ADO/E	MUR+ADO/LWAL+CDN/H:2/RES	$2,524.1M	114,122	3.08%	4.25%
RC	CR/LDUAL+CDL/H:2/RES	$2,179.2M	63,059	2.66%	2.35%
MUR	MUR+STRUB/LWAL+CDN/H:2/RES	$1,918.5M	98,311	2.34%	3.66%
MCF	MCF/LWAL+CDL/HBET:3-6/RES	$1,668.3M	4,620	2.04%	0.17%
ADO/E	MUR+ADO/LWAL+CDN/H:1/RES	$1,532.7M	117,053	1.87%	4.36%
RC	CR/LFINF+CDL/H:1/RES	$1,338.7M	25,198	1.63%	0.94%
	CR/LDUAL+CDL/HBET:4-7/RES	$1,194.6M	2,310	1.46%	0.09%
MUR	MUR+STRUB/LWAL+CDN/H:1/RES	$1,165.0M	100,832	1.42%	3.76%
RC	CR/LWAL+CDL/H:2/RES	$1,089.6M	31,532	1.33%	1.17%
S	S/LFM+CDL/H:1/IND	$1,009.8M	10,149	1.23%	0.38%
	CR/LFINF+CDL/H:1/IND	$945.2M	46,199	1.15%	1.72%
RC	CR/LFINF+CDL/HBET:8+/RES	$933.3M	1,446	1.14%	0.05%
	CR/LFINF+CDL/H:2/IND	$917.3M	8,379	1.12%	0.31%
MUR	MUR+CB/LWAL+CDN/HBET:3-6/RES	$774.0M	3,238	0.94%	0.12%
	MUR+CL/LWAL+CDN/HBET:3-6/RES	$774.0M	3,238	0.94%	0.12%
RC	CR/LFINF+CDL/H:3/COM	$761.6M	2,832	0.93%	0.11%
S	S/LFM+CDL/H:2/IND	$734.4M	3,382	0.90%	0.13%
	MUR+CB/LWAL+CDN/H:1/IND	$699.4M	11,075	0.85%	0.41%
	MUR+CL/LWAL+CDN/H:1/IND	$699.4M	11,075	0.85%	0.41%
MUR	MUR+CB/LWAL+CDN/H:2/COM	$689.7M	6,713	0.84%	0.25%
	MUR+CL/LWAL+CDN/H:2/COM	$689.7M	6,713	0.84%	0.25%
	MUR+CB/LWAL+CDN/H:1/COM	$671.8M	13,415	0.82%	0.50%
	MUR+CL/LWAL+CDN/H:1/COM	$671.8M	13,415	0.82%	0.50%
RC	CR/LFINF+CDL/H:2/COM	$667.1M	2,792	0.81%	0.10%
	CR/LFINF+CDL/H:2/RES	$627.3M	4,246	0.77%	0.16%
S	S+SL/LFM+CDL/H:1/IND	$625.3M	6,278	0.76%	0.23%
MCF	MCF/LWAL+CDL/H:1/IND	$611.5M	6,697	0.75%	0.25%
	MCF/LWAL+CDL/H:2/IND	$599.1M	4,376	0.73%	0.16%
RC	CR/LWAL+CDL/HBET:4-7/RES	$597.3M	1,154	0.73%	0.04%
MCF	MCF/LWAL+CDL/H:1/COM	$583.5M	8,742	0.71%	0.33%
ADO/E	MUR+ADO/LWAL+CDN/H:2/RES	$545.6M	6,637	0.67%	0.25%
	MUR+ADO/LWAL+CDN/H:1/RES	$531.4M	13,271	0.65%	0.49%
W	W/LWAL+CDL/H:2/RES	$526.5M	17,683	0.64%	0.66%
MUR	MUR+CB/LWAL+CDN/H:2/IND	$508.6M	3,698	0.62%	0.14%
	MUR+CL/LWAL+CDN/H:2/IND	$508.6M	3,698	0.62%	0.14%
	MUR+STDRE/LWAL+CDN/H:2/RES	$491.2M	20,137	0.60%	0.75%