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 = "Yemen"
```

```
Exposure files:
  Exposure_Com_Yemen.csv
  Exposure_Ind_Yemen.csv
  Exposure_Res_Yemen.csv
```

Sanity checks and formats

```
Yemen
  Exposure/Exposure/Exposure_Com_Yemen.csv
  Exposure/Exposure/Exposure_Ind_Yemen.csv
  Exposure/Exposure/Exposure_Res_Yemen.csv
  Occupants / Dwellings = 7.0
  Reference avg household size (2019) = 6.68
  Population (exposure / UN_2021) = 1.0
  Exposure models  OK
```

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	30.5M	4,080.4K	$153.1B	93.19%	77.10%
Ind	0.0M	54.9K	$12.1B	1.25%	6.10%
Com	0.0M	243.2K	$33.4B	5.55%	16.81%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	580.9M	$156.7B	133	$342
Res	494.8M	$127.7B	121	$309
Ind	22.8M	$6.4B	415	$531
Com	63.3M	$22.5B	260	$527

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Ta'izz Governorate	$27,358.9M	595,525	3,711.3K	13.78%	13.60%	12.18%
Al Hudaydah Governorate	$22,766.0M	576,075	3,342.4K	11.47%	13.16%	10.97%
Ibb Governorate	$22,365.0M	478,139	3,304.7K	11.26%	10.92%	10.84%
San?a?	$20,133.7M	426,545	2,878.2K	10.14%	9.74%	9.44%
Dhamar Governorate	$14,192.8M	307,147	2,061.1K	7.15%	7.01%	6.76%
Hajjah Governorate	$12,775.6M	295,659	2,293.0K	6.43%	6.75%	7.52%
Hadhramaut	$10,044.9M	219,667	1,577.1K	5.06%	5.02%	5.17%
Lahij Governorate	$8,012.1M	177,276	1,119.9K	4.04%	4.05%	3.67%
San?a? Governorate	$7,558.4M	160,214	1,257.0K	3.81%	3.66%	4.12%
'Amran Governorate	$7,535.7M	155,995	1,361.1K	3.80%	3.56%	4.47%
?Adan Governorate	$6,736.3M	147,174	912.9K	3.39%	3.36%	3.00%
Sa'dah Governorate	$5,877.8M	124,248	1,043.3K	2.96%	2.84%	3.42%
Al Bayda' Governorate	$5,210.0M	109,418	895.1K	2.62%	2.50%	2.94%
Al Mahwit Governorate	$4,775.9M	102,092	766.7K	2.41%	2.33%	2.52%
Ad Dali' Governorate	$4,477.9M	94,983	729.4K	2.26%	2.17%	2.39%
Abyan Governorate	$4,170.0M	92,494	672.0K	2.10%	2.11%	2.20%
Shabwah Governorate	$3,956.9M	83,018	729.3K	1.99%	1.90%	2.39%
Al Jawf Governorate	$3,937.4M	88,327	687.6K	1.98%	2.02%	2.26%
Raymah Governorate	$3,691.9M	78,674	611.4K	1.86%	1.80%	2.01%
Ma'rib Governorate	$2,052.0M	43,724	369.6K	1.03%	1.00%	1.21%
Al Mahrah Governorate	$819.8M	19,860	137.3K	0.41%	0.45%	0.45%
Socotra	$95.6M	2,225	16.1K	0.05%	0.05%	0.05%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
RC	$81,485.4M	1,164,914	8,686.4K	41.04%	26.61%	28.50%
MUR	$74,771.5M	2,095,559	14,774.5K	37.66%	47.86%	48.48%
ADO/E	$28,530.5M	928,674	6,157.6K	14.37%	21.21%	20.20%
MCF	$7,760.9M	49,640	0.0K	3.91%	1.13%	0.00%
S	$3,578.5M	16,466	0.0K	1.80%	0.38%	0.00%
OT	$1,926.2M	120,484	857.9K	0.97%	2.75%	2.82%
MR	$491.7M	2,742	16.1K	0.25%	0.06%	0.05%

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+ST/LWAL+CDN/H:2/RES	$17,769.1M	512,570	9.99%	12.48%
RC	CR+CIP/LFINF+CDL/H:2/RES	$14,102.7M	271,205	7.93%	6.61%
	MUR+ST/LWAL+CDN/H:1/RES	$13,668.6M	512,570	7.68%	12.48%
MUR	MUR+CB/LWAL+CDN/H:2/RES	$13,097.7M	377,820	7.36%	9.20%
	MUR+CB/LWAL+CDN/H:3/RES	$12,573.8M	251,877	7.07%	6.14%
ADO/E	MUR+ADO/LWAL+CDN/H:2/RES	$12,448.7M	320,623	7.00%	7.81%
RC	CR+CIP/LFINF+CDL/H:1/RES	$10,848.2M	271,205	6.10%	6.61%
ADO/E	MUR+ADO/LWAL+CDN/H:1/RES	$9,575.9M	320,623	5.38%	7.81%
MUR	MUR+CB/LWAL+CDN/H:1/RES	$8,635.9M	323,848	4.85%	7.89%
	CR+CIP/LFINF+CDL/H:3/RES	$6,769.3M	90,403	3.80%	2.20%
RC	CR+CIP/LFINF+CDM/H:2/RES	$6,636.5M	127,626	3.73%	3.11%
	CR/LFINF+CDL/HBET:4-7/COM	$6,091.5M	7,513	3.42%	0.18%
	CR+CIP/LFINF+CDM/H:1/RES	$5,105.0M	127,626	2.87%	3.11%
ADO/E	EU/LWAL+CDN/H:1/RES	$4,276.9M	200,480	2.40%	4.88%
RC	CR+CIP/LFINF+CDL/H:3/COM	$3,185.5M	42,544	1.79%	1.04%
	CR/LFINF+CDM/HBET:4-7/COM	$2,865.7M	3,529	1.61%	0.09%
MUR	MUR+CB/LWAL+CDN/HBET:3-6/COM	$2,714.2M	6,900	1.53%	0.17%
RC	CR/LFINF+CDL/H:3/RES	$2,651.4M	35,408	1.49%	0.86%
MCF	MCF/LWAL+CDL/HBET:3-6/COM	$2,624.6M	5,009	1.48%	0.12%
RC	CR/LFINF+CDL/H:1/RES	$2,367.3M	45,525	1.33%	1.11%
	CR/LFINF+CDL/HBET:8-13/COM	$1,999.0M	933	1.12%	0.02%
	CR/LFINF+CDL/H:3/COM	$1,820.8M	7,828	1.02%	0.19%
MUR	MUR+CB/LWAL+CDN/H:2/COM	$1,793.2M	23,007	1.01%	0.56%
RC	CR/LFINF+CDL/HBET:4-7/RES	$1,775.5M	3,161	1.00%	0.08%
S	S/LFM+CDL/H:1/IND	$1,583.3M	8,398	0.89%	0.20%
OT	MATO/RES	$1,440.7M	81,037	0.81%	1.97%
MCF	MCF/LWAL+CDN/H:2/RES	$1,300.6M	12,511	0.73%	0.30%
MUR	MUR+CB/LWAL+CDN/H:1/COM	$1,262.5M	34,515	0.71%	0.84%
RC	CR/LFINF+CDM/H:3/RES	$1,247.6M	16,662	0.70%	0.41%
MCF	MCF/LWAL+CDM/HBET:3-6/COM	$1,232.8M	2,356	0.69%	0.06%
	CR+PC/LWAL+CDL/H:1/IND	$1,161.1M	5,599	0.65%	0.14%
RC	CR/LFINF+CDL/H:1/IND	$1,161.1M	5,599	0.65%	0.14%
	CR/LFINF+CDM/H:2/RES	$1,114.0M	21,424	0.63%	0.52%
MUR	MUR+ST/LWAL+CDN/H:1/COM	$1,010.0M	27,621	0.57%	0.67%