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 = "Cook_Islands"
```

```
Exposure files:
  Exposure_Com_Cook_Islands.csv
  Exposure_Ind_Cook_Islands.csv
  Exposure_Res_Cook_Islands.csv
```

Sanity checks and formats

```
Cook_Islands
  ../Exposure/Pacific_Islands/Exposure_Com_Cook_Islands.csv
  ../Exposure/Pacific_Islands/Exposure_Ind_Cook_Islands.csv
  ../Exposure/Pacific_Islands/Exposure_Res_Cook_Islands.csv
  WARNING: Number_dwellings < Number_buildings
  Occupants / Dwellings = 4.1
  No refence household size data available
  Population (exposure / UN_2021) = 1.01
  WARNING: ADM_1 with empty values:
  OCCUPANCY  Com  Ind                      Res
ID_1
COK.4_1     NaN  NaN  Suwarrow_National_Park
  Exposure models  OK
```

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	17.8K	8,357	$1,191.6M	83.72%	64.19%
Ind	0.0K	60	$26.9M	0.60%	1.45%
Com	0.0K	1,565	$637.7M	15.68%	34.36%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	COST_PER_CAPITA	AVG_BUILDING_AREA_SQM	AVG_COST_PE
Total	1,745.4K	$1,213.4M	$104,313	175	
Res	1,123.8K	$812.9M	$66,964	134	
Ind	15.9K	$13.7M	$1,512	265	
Com	605.7K	$386.7M	$35,838	387	

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_
Rarotonga	$1,502,571.0K	5,855	13,095	80.95%	58.66%	73.59
Southern_Islands	$312,157.0K	3,182	3,586	16.82%	31.88%	20.15
Northern_Islands	$41,450.0K	943	1,113	2.23%	9.45%	6.25
Suwarrow_National_Park	$73.9K	2	1	0.00%	0.02%	0.0

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MCF	$861.0M	5,132	9,004	46.38%	51.41%	50.60%
W	$646.0M	4,416	8,120	34.80%	44.24%	45.63%
RC	$299.7M	358	622	16.15%	3.59%	3.50%
S	$49.5M	76	49	2.67%	0.76%	0.27%

Exposure by taxonomy

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

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MCF	MCF/LWAL+DUL/H:1/RES	$617.3M	4,499	37.05%	48.82%
W	W+WLI/LFBR+DUL/H:1/RES	$241.1M	2,268	14.47%	24.61%
MCF	MCF/LWAL+DUL/H:1/COM	$240.1M	623	14.41%	6.76%
RC	CR+CIP/LFINF+DUL/HBET:2-3/COM	$156.5M	124	9.39%	1.35%
W	W+WLI/LFBR+DUL/H:1/COM	$147.4M	633	8.85%	6.87%
RC	CR+CIP/LFINF+DUL/HBET:2-3/RES	$141.5M	232	8.49%	2.52%
W	W+WLI/LPB+DUL/H:1/RES	$78.3M	724	4.70%	7.86%
W	W+WLI/LPB+DUL/HBET:2-3/RES	$44.0M	112	2.64%	1.22%