

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 = "Madagascar"
```

Exposure files:
Exposure_Com_Madagascar.csv
Exposure_Ind_Madagascar.csv
Exposure_Res_Madagascar.csv

Sanity checks and formats

Madagascar
Exposure/Exposure/Exposure_Com_Madagascar.csv
Exposure/Exposure/Exposure_Ind_Madagascar.csv
Exposure/Exposure/Exposure_Res_Madagascar.csv
Occupants / Dwellings = 4.4
Reference avg household size (2019) = 4.72
Population (exposure / UN_2021) = 0.97
Exposure models OK

Exposure at National level

Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	27.6M	5,998.2K	\$87.4B	95.07%	80.72%
Ind	0.0M	80.0K	\$6.3B	1.27%	5.81%
Com	0.0M	231.2K	\$14.6B	3.66%	13.47%

Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	537.9M	\$87,076.0M	85	\$201
Res	470.9M	\$72,552.4M	79	\$186
Ind	22.8M	\$4,142.3M	285	\$276
Com	44.2M	\$10,381.3M	191	\$330

Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Analamanga	\$18,032.3M	1,050.4K	4,596.1K	16.65%	16.65%	16.65%
Vakinankaratra	\$7,218.3M	420.5K	1,840.0K	6.67%	6.66%	6.66%
Vatovavy-Fitovinany	\$6,676.7M	389.0K	1,701.9K	6.17%	6.16%	6.16%
Atsimo-Andrefana	\$6,499.0M	378.6K	1,656.7K	6.00%	6.00%	6.00%
Sofia	\$6,360.9M	370.5K	1,621.5K	5.87%	5.87%	5.87%
Atsimo-Atsinanana	\$6,176.5M	359.8K	1,574.4K	5.70%	5.70%	5.70%
Atsinanana	\$5,149.2M	300.0K	1,312.7K	4.75%	4.75%	4.75%
Boeny	\$4,776.2M	278.3K	1,217.6K	4.41%	4.41%	4.41%
Analanjirifo	\$4,723.2M	275.2K	1,204.1K	4.36%	4.36%	4.36%
Matsiatra Ambony	\$4,664.9M	271.8K	1,189.3K	4.31%	4.31%	4.31%
Androy	\$4,574.1M	266.5K	1,166.1K	4.22%	4.22%	4.22%
Alaotra-Mangoro	\$4,493.7M	261.8K	1,145.6K	4.15%	4.15%	4.15%
Sava	\$4,270.6M	248.8K	1,088.7K	3.94%	3.94%	3.94%
Diana	\$3,901.8M	227.3K	994.7K	3.60%	3.60%	3.60%
Menabe	\$3,686.7M	214.8K	939.9K	3.40%	3.40%	3.40%
Itasy	\$3,036.3M	176.9K	774.1K	2.80%	2.80%	2.80%
Anosy	\$3,035.9M	176.9K	774.0K	2.80%	2.80%	2.80%
Amoron'i Mania	\$2,698.6M	157.3K	688.2K	2.49%	2.49%	2.49%
Bongolava	\$2,674.4M	155.9K	682.0K	2.47%	2.47%	2.47%
Ihorombe	\$2,235.0M	130.2K	570.0K	2.06%	2.06%	2.06%
Melaky	\$2,047.9M	119.4K	522.3K	1.89%	1.89%	1.89%
Betsiboka	\$1,365.8M	79.7K	348.7K	1.26%	1.26%	1.26%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
MUR	\$42,405.4M	2,068.4K	8,836.7K	39.16%	32.78%	32.01%
W	\$27,936.1M	1,663.7K	7,324.6K	25.80%	26.37%	26.53%
ADO/E	\$25,432.2M	1,845.8K	8,260.5K	23.48%	29.25%	29.92%
RC	\$4,365.2M	87.5K	467.7K	4.03%	1.39%	1.69%
MCF	\$3,563.1M	108.7K	467.7K	3.29%	1.72%	1.69%
OT	\$2,422.8M	515.3K	2,251.5K	2.24%	8.17%	8.16%
S	\$2,173.0M	20.0K	0.0K	2.01%	0.32%	0.00%

Exposure by taxonomy

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

		COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MACRO_TAXO	TAXONOMY				
ADO/E	MUR+ADO/LWAL+CDN/H:2/RES	\$11,402.7M	598,306	11.73%	9.90%
MUR	MUR+CB/LWAL+CDN/H:2/RES	\$8,798.9M	415,513	9.06%	6.88%
W	W+WWD/LWAL+CDN/H:1/RES	\$8,007.1M	851,576	8.24%	14.09%
ADO/E	MUR+ADO/LWAL+CDN/H:1/RES	\$6,923.9M	613,643	7.13%	10.15%
W	W+WWD/LWAL+CDN/H:2/RES	\$5,651.4M	355,836	5.82%	5.89%
MUR	MUR+CB/LWAL+CDN/H:1/RES	\$5,342.8M	426,166	5.50%	7.05%
	MUR+CL/LWAL+CDN/H:2/RES	\$5,155.2M	243,446	5.31%	4.03%
W	W/LWAL+CDL/H:2/RES	\$4,018.8M	158,151	4.14%	2.62%
MUR	MUR+STRUB/LWAL+CDN/H:2/RES	\$3,172.6M	187,276	3.26%	3.10%
	MUR+CL/LWAL+CDN/H:1/RES	\$3,130.3M	249,686	3.22%	4.13%
ADO/E	EWV/LN+CDN/H:1/RES	\$2,662.2M	566,254	2.74%	9.37%
	W/LWAL+CDL/H:3/RES	\$2,468.7M	63,193	2.54%	1.05%
W	W/LWAL+CDL/H:1/RES	\$2,440.3M	162,206	2.51%	2.68%
	W/LWAL+CDL/H:2/COM	\$2,072.8M	21,821	2.13%	0.36%
MUR	MUR+STDRE/LWAL+CDN/H:2/RES	\$2,024.3M	95,596	2.08%	1.58%
W	W/LWAL+CDL/H:1/COM	\$2,018.8M	43,656	2.08%	0.72%
MUR	MUR+STRUB/LWAL+CDN/H:1/RES	\$1,926.4M	192,077	1.98%	3.18%
OT	ME+MEO/LWAL+CDN/H:1/RES	\$1,834.5M	390,214	1.89%	6.46%
ADO/E	MUR+ADO/LWAL+CDN/HBET:3-6/RES	\$1,507.5M	8,070	1.55%	0.13%
RC	CR/LFINF+CDL/H:3/RES	\$1,422.9M	30,958	1.46%	0.51%
	MUR+ADO/LWAL+CDN/H:2/COM	\$1,379.8M	19,561	1.42%	0.32%
ADO/E	MUR+ADO/LWAL+CDN/H:1/COM	\$1,343.9M	39,124	1.38%	0.65%
W	W/LWAL+CDL/H:3/COM	\$1,258.4M	7,273	1.30%	0.12%
	MUR+STDRE/LWAL+CDN/H:1/RES	\$1,229.2M	98,043	1.26%	1.62%
MUR	MUR+CB/LWAL+CDN/HBET:3-6/RES	\$1,163.3M	5,604	1.20%	0.09%
RC	CR/LFINF+CDL/H:2/RES	\$1,158.2M	38,743	1.19%	0.64%
MUR	MUR+CB/LWAL+CDN/H:2/COM	\$1,131.2M	12,831	1.16%	0.21%
MCF	MCF+CB/LWAL+CDL/H:2/RES	\$1,114.7M	35,092	1.15%	0.58%
	MUR+CB/LWAL+CDN/H:1/COM	\$1,101.7M	25,652	1.13%	0.42%
MUR	MUR+CB/LWAL+CDN/H:1/IND	\$863.3M	16,011	0.89%	0.26%
S	S+SL/LFM+CDL/H:1/IND	\$715.8M	8,529	0.74%	0.14%
	MUR+CL/LWAL+CDN/H:2/COM	\$693.9M	7,866	0.71%	0.13%
MUR	MUR+CL/LWAL+CDN/HBET:3-6/RES	\$681.6M	3,292	0.70%	0.05%
MCF	MCF+CB/LWAL+CDL/H:1/RES	\$676.9M	35,992	0.70%	0.60%
MUR	MUR+CL/LWAL+CDN/H:1/COM	\$675.9M	15,739	0.70%	0.26%

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