

# 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 Shapely GEOS version (3.9.1-CAPI-1.14.2) is incompatible with the GEOS version PyGEOS was compiled with (3.10.1-CAPI-1.16.0). Conversions between both will be slow.
  warnings.warn(
```

```
# Parameters
country = "Saudi_Arabia"
```

Exposure files:  
Exposure\_Com\_Saudi\_Arabia.csv  
Exposure\_Ind\_Saudi\_Arabia.csv  
Exposure\_Res\_Saudi\_Arabia.csv

## Sanity checks and formats

**Saudi\_Arabia**  
Exposure/Exposure/Exposure\_Com\_Saudi\_Arabia.csv  
Exposure/Exposure/Exposure\_Ind\_Saudi\_Arabia.csv  
Exposure/Exposure/Exposure\_Res\_Saudi\_Arabia.csv  
Occupants / Dwellings = 5.6  
No refence household size data available  
Population (exposure / UN\_2021) = 0.96  
**Exposure models OK**

## Exposure at National level

### Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	33.9M	2,729.2K	\$1,134.6B	85.06%	75.80%
Ind	0.0M	109.7K	\$55.6B	3.42%	3.71%
Com	0.0M	369.7K	\$306.7B	11.52%	20.49%

### Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	1,219.3M	\$1,063.4B	380	\$1,228
Res	1,039.8M	\$846.9B	381	\$1,091
Ind	45.5M	\$26.9B	415	\$1,220
Com	134.0M	\$189.6B	362	\$2,289

## Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Makkah Region	\$417.1B	917.5K	8,655.2K	27.87%	28.59%	25.52%
Riyadh Region	\$372.0B	773.0K	8,459.9K	24.85%	24.09%	24.94%
Eastern Region	\$203.6B	410.0K	4,943.7K	13.60%	12.78%	14.58%
'Asir Region	\$108.1B	230.8K	2,465.7K	7.22%	7.19%	7.27%
Al Madinah Region	\$99.1B	219.6K	2,203.4K	6.62%	6.84%	6.50%
Jazan Region	\$67.4B	154.0K	1,731.4K	4.50%	4.80%	5.10%
Al-Qassim Region	\$65.8B	143.2K	1,538.7K	4.40%	4.46%	4.54%
Tabuk Region	\$43.2B	94.5K	1,011.4K	2.89%	2.94%	2.98%
Hayel Region	\$31.3B	70.5K	771.5K	2.09%	2.20%	2.27%
Najran Region	\$27.6B	66.0K	645.3K	1.85%	2.06%	1.90%
Al Bahah Region	\$23.9B	49.6K	529.0K	1.60%	1.55%	1.56%
Al Jawf Region	\$23.0B	49.5K	556.6K	1.54%	1.54%	1.64%
Northern Borders Region	\$14.6B	30.4K	405.0K	0.98%	0.95%	1.19%

## Exposure by simplified taxonomy

Adding `MACRO\_TAXO` column

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
RC	\$1,043,849.1M	1,940.0K	26,440.4K	69.74%	60.46%	77.96%
MCF	\$231,036.9M	661.1K	5,392.4K	15.44%	20.60%	15.90%
MUR	\$101,902.7M	324.2K	1,387.8K	6.81%	10.11%	4.09%
MR	\$58,147.6M	112.1K	0.0K	3.88%	3.49%	0.00%
S	\$40,261.8M	48.5K	0.0K	2.69%	1.51%	0.00%
OT	\$17,815.5M	104.9K	595.9K	1.19%	3.27%	1.76%
ADO/E	\$3,821.8M	17.8K	100.3K	0.26%	0.56%	0.30%

## Exposure by taxonomy

Showing only taxonomies that represent 90% of the total `COST\_USD`

		COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MACRO_TAXO	TAXONOMY				
	CR/LFINF+CDL/HBET:4-7/RES	\$227.6B	111,187	16.94%	3.76%
RC	CR/LFINF+CDL/H:3/RES	\$175.5B	250,182	13.06%	8.46%
	CR/LFINF+CDL/H:2/RES	\$145.9B	667,145	10.86%	22.55%
MCF	MCF/LWAL+CDL/H:2/RES	\$70.6B	301,348	5.26%	10.18%
	CR/LFINF+CDL/H:1/RES	\$64.2B	333,570	4.78%	11.27%
RC	CR/LFINF+CDM/HBET:4-7/RES	\$64.2B	31,362	4.78%	1.06%
MCF	MCF/LWAL+CDL/HBET:3-6/RES	\$55.1B	25,112	4.10%	0.85%
	CR/LFINF+CDM/H:3/RES	\$49.5B	70,566	3.68%	2.38%
RC	CR/LFINF+CDM/H:2/RES	\$41.1B	188,167	3.06%	6.36%
	CR/LDUAL+CDL/HBET:4-7/RES	\$40.7B	19,881	3.03%	0.67%
MCF	MCF/LWAL+CDL/H:1/RES	\$31.1B	150,674	2.31%	5.09%
RC	CR/LFINF+CDL/HBET:4-7/COM	\$26.7B	8,391	1.99%	0.28%
MUR	MUR+CB/LWAL+CDN/HBET:3-6/COM	\$24.8B	11,424	1.85%	0.39%
	CR/LDUAL+CDL/HBET:8-/RES	\$23.3B	8,520	1.73%	0.29%
MCF	MCF/LWAL+CDM/H:2/RES	\$19.9B	84,995	1.48%	2.87%
MR	MR+CB/LWAL+CDL/HBET:3-6/COM	\$19.4B	8,908	1.44%	0.30%
	MUR+STDRE/LWAL+CDN/H:2/RES	\$19.3B	99,821	1.43%	3.37%
MUR	MUR+CB/LWAL+CDN/H:2/COM	\$18.6B	38,082	1.39%	1.29%
RC	CR/LFINF+CDM/H:1/RES	\$18.1B	94,084	1.35%	3.18%
OT	MATO/RES	\$17.8B	104,928	1.33%	3.55%
MUR	MUR+STDRE/LWAL+CDN/H:1/RES	\$16.9B	99,821	1.26%	3.37%
	CR/LDUAL+CDL/HBET:4-7/COM	\$15.7B	4,993	1.17%	0.17%
RC	CR/LWAL+CDL/HBET:4-7/COM	\$15.7B	4,993	1.17%	0.17%
MCF	MCF/LWAL+CDM/HBET:3-6/RES	\$15.5B	7,085	1.16%	0.24%
MR	MR+CB/LWAL+CDL/H:2/COM	\$14.5B	29,699	1.08%	1.00%
MUR	MUR+CB/LWAL+CDN/H:1/COM	\$12.3B	57,123	0.91%	1.93%
RC	CR/LDUAL+CDM/HBET:4-7/RES	\$11.5B	5,607	0.85%	0.19%
MCF	MCF/LWAL+CDL/HBET:3-6/COM	\$10.9B	4,993	0.81%	0.17%
	CR/LFINF+CDL/HBET:8-/COM	\$10.3B	1,040	0.77%	0.04%
S	S/LFM+CDL/HBET:4-7/COM	\$9.7B	2,799	0.72%	0.09%
MR	MR+CB/LWAL+CDL/H:1/COM	\$9.6B	44,557	0.71%	1.51%
MCF	MCF/LWAL+CDM/H:1/RES	\$8.8B	42,496	0.65%	1.44%
RC	CR/LFINF+CDL/H:3/COM	\$8.8B	8,741	0.65%	0.30%
S	S/LFM+CDL/H:1/IND	\$8.2B	19,260	0.61%	0.65%
MUR	MUR+STDRE/LWAL+CDN/H:3/RES	\$7.7B	12,481	0.57%	0.42%
	CR/LFINF+CDM/HBET:4-7/COM	\$7.5B	2,363	0.56%	0.08%
RC	CR/LDUAL+CDM/HBET:8-/RES	\$6.6B	2,403	0.49%	0.08%