

# 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 = "Libya"
```

Exposure files:  
Exposure\_Com\_Libya.csv  
Exposure\_Ind\_Libya.csv  
Exposure\_Res\_Libya.csv

## Sanity checks and formats

Libya  
Exposure/Exposure/Exposure\_Com\_Libya.csv  
Exposure/Exposure/Exposure\_Ind\_Libya.csv  
Exposure/Exposure/Exposure\_Res\_Libya.csv  
Occupants / Dwellings = 5.5  
Reference avg household size (2019) = 5.6  
Population (exposure / UN\_2021) = 0.98  
Exposure models OK

## Exposure at National level

### Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	6.8M	1,103.3K	\$44,235.2M	94.24%	81.38%
Ind	0.0M	22.8K	\$3,626.1M	1.95%	6.67%
Com	0.0M	44.7K	\$6,494.8M	3.82%	11.95%

### Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	119.1M	\$41,871.6M	102	\$456
Res	102.8M	\$35,410.1M	93	\$430
Ind	6.5M	\$2,064.7M	285	\$559
Com	9.8M	\$4,396.7M	220	\$660

## Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Tripoli	\$10,208.0M	219,572	1,284.0K	18.78%	18.76%	18.75%
Benghazi	\$6,478.8M	139,345	815.0K	11.92%	11.90%	11.90%
Misrata	\$5,435.8M	116,946	683.9K	10.00%	9.99%	9.99%
Jafara	\$4,284.6M	92,208	539.2K	7.88%	7.88%	7.88%
Murqub	\$3,910.1M	84,142	492.1K	7.19%	7.19%	7.19%
Jabal al Gharbi	\$2,979.3M	64,123	375.0K	5.48%	5.48%	5.48%
Zawiya	\$2,800.9M	60,288	352.5K	5.15%	5.15%	5.15%
Nuqat al Khams	\$2,762.4M	59,467	347.8K	5.08%	5.08%	5.08%
Jabal al Akhdar	\$1,983.7M	42,740	250.0K	3.65%	3.65%	3.65%
Marj	\$1,775.7M	38,280	223.8K	3.27%	3.27%	3.27%
Al Wahat	\$1,720.7M	37,094	216.9K	3.17%	3.17%	3.17%
Derna	\$1,559.9M	33,635	196.6K	2.87%	2.87%	2.87%
Butnan	\$1,511.2M	32,573	190.5K	2.78%	2.78%	2.78%
Sirte	\$1,345.9M	29,034	169.8K	2.48%	2.48%	2.48%
Sabha	\$1,281.9M	27,658	161.7K	2.36%	2.36%	2.36%
Nalut	\$900.5M	19,476	113.9K	1.66%	1.66%	1.66%
Murzuq	\$754.9M	16,330	95.5K	1.39%	1.39%	1.40%
Wadi al Shatii	\$753.7M	16,305	95.4K	1.39%	1.39%	1.39%
Wadi al Hayaa	\$731.6M	15,841	92.6K	1.35%	1.35%	1.35%
Jufra	\$499.1M	10,818	63.2K	0.92%	0.92%	0.92%
Kufra	\$460.1M	10,031	58.7K	0.85%	0.86%	0.86%
Ghat	\$217.6M	4,811	28.1K	0.40%	0.41%	0.41%

## Exposure by simplified taxonomy

Adding `MACRO\_TAXO` column

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
RC	\$22,020.8M	266.3K	1,878.5K	40.51%	22.75%	27.44%
MUR	\$17,003.8M	506.2K	2,781.9K	31.28%	43.24%	40.63%
MCF	\$9,020.2M	165.5K	939.3K	16.59%	14.13%	13.72%
ADO/E	\$4,136.0M	174.4K	959.7K	7.61%	14.90%	14.02%
S	\$1,050.7M	5.7K	0.0K	1.93%	0.49%	0.00%
W	\$862.6M	19.1K	102.4K	1.59%	1.63%	1.50%
OT	\$262.1M	33.5K	184.4K	0.48%	2.86%	2.69%

## Exposure by taxonomy

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

		COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MACRO_TAXO	TAXONOMY				
RC	CR/LFINF+CDL/H:3/RES	\$4,495.9M	59,005	9.23%	5.42%
MCF	MCF/LWAL+CDL/H:2/RES	\$4,014.9M	75,942	8.25%	6.98%
RC	CR/LFINF+CDL/H:2/RES	\$3,659.4M	73,835	7.52%	6.78%
MUR	MUR+CB/LWAL+CDN/H:2/RES	\$3,455.5M	98,774	7.10%	9.08%
MUR	MUR+CL/LWAL+CDN/H:2/RES	\$3,455.5M	98,774	7.10%	9.08%
MCF	MCF/LWAL+CDL/H:1/RES	\$2,437.9M	77,890	5.01%	7.16%
MUR	MUR+CB/LWAL+CDN/H:1/RES	\$2,098.3M	101,306	4.31%	9.31%
MUR	MUR+CL/LWAL+CDN/H:1/RES	\$2,098.3M	101,306	4.31%	9.31%
	CR/LFINF+CDL/HBET:4-7/RES	\$2,006.0M	2,704	4.12%	0.25%
RC	CR/LDUAL+CDL/H:3/RES	\$1,798.3M	23,601	3.69%	2.17%
	CR/LDUAL+CDL/H:2/RES	\$1,463.8M	29,536	3.01%	2.71%
ADO/E	E+ETO/LWAL+CDN/H:1/RES	\$1,345.8M	85,999	2.76%	7.90%
ADO/E	MUR+ADO/LWAL+CDN/H:2/RES	\$1,263.3M	39,828	2.59%	3.66%
MCF	MCF/LWAL+CDL/HBET:3-6/RES	\$1,120.6M	2,164	2.30%	0.20%
	CR/LWAL+CDL/H:3/RES	\$899.2M	11,805	1.85%	1.08%
RC	CR/LDUAL+CDL/HBET:4-7/RES	\$802.4M	1,082	1.65%	0.10%
ADO/E	MUR+ADO/LWAL+CDN/H:1/RES	\$767.1M	40,853	1.58%	3.75%
MUR	MUR+STRUB/LWAL+CDN/H:2/RES	\$744.0M	26,585	1.53%	2.44%
	CR/LWAL+CDL/H:2/RES	\$731.9M	14,763	1.50%	1.36%
	CR/LFINF+CDL/H:1/RES	\$634.9M	21,635	1.30%	1.99%
RC	CR/LFINF+CDL/HBET:8+/RES	\$626.9M	675	1.29%	0.06%
	CR/LFINF+CDL/H:3/COM	\$549.2M	1,426	1.13%	0.13%
MUR	MUR+CB/LWAL+CDN/HBET:3-6/RES	\$456.8M	1,338	0.94%	0.12%
MUR	MUR+CL/LWAL+CDN/HBET:3-6/RES	\$456.8M	1,338	0.94%	0.12%
RC	CR/LFINF+CDL/H:2/COM	\$452.4M	2,138	0.93%	0.20%
MUR	MUR+STRUB/LWAL+CDN/H:1/RES	\$451.8M	27,265	0.93%	2.51%
MCF	MCF/LWAL+CDL/H:2/COM	\$432.0M	2,199	0.89%	0.20%
MUR	MUR+CB/LWAL+CDN/H:2/COM	\$427.0M	2,898	0.88%	0.27%
MUR	MUR+CL/LWAL+CDN/H:2/COM	\$427.0M	2,898	0.88%	0.27%
MCF	MCF/LWAL+CDL/H:1/COM	\$420.8M	4,393	0.86%	0.40%
S	S/LFM+CDL/H:1/IND	\$417.1M	2,929	0.86%	0.27%
MUR	MUR+CB/LWAL+CDN/H:1/COM	\$415.9M	5,792	0.85%	0.53%
MUR	MUR+CL/LWAL+CDN/H:1/COM	\$415.9M	5,792	0.85%	0.53%
	CR/LWAL+CDL/HBET:4-7/RES	\$401.2M	542	0.82%	0.05%
RC	CR/LFINF+CDL/H:1/IND	\$396.8M	2,525	0.82%	0.23%
	CR/LFINF+CDL/HBET:4-7/COM	\$344.0M	366	0.71%	0.03%
MUR	MUR+STDRE/LWAL+CDN/H:2/RES	\$329.9M	9,429	0.68%	0.87%
W	W/LWAL+CDL/H:2/RES	\$311.5M	7,298	0.64%	0.67%
S	S/LFM+CDL/H:2/IND	\$301.4M	971	0.62%	0.09%
RC	CR/LFINF+CDL/H:2/IND	\$288.6M	846	0.59%	0.08%
ADO/E	MUR+ADO/LWAL+CDN/H:2/COM	\$281.0M	2,378	0.58%	0.22%
ADO/E	MUR+ADO/LWAL+CDN/H:1/COM	\$273.6M	4,767	0.56%	0.44%
MCF	MCF/LWAL+CDL/H:1/IND	\$264.6M	2,023	0.54%	0.19%
RC	CR/LDUAL+CDL/H:1/RES	\$253.9M	8,656	0.52%	0.80%