

# 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 = "Kenya"
```

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

## Sanity checks and formats

Kenya  
Exposure/Exposure/Exposure\_Com\_Kenya.csv  
Exposure/Exposure/Exposure\_Ind\_Kenya.csv  
Exposure/Exposure/Exposure\_Res\_Kenya.csv  
Occupants / Dwellings = 3.6  
Reference avg household size (2019) = 3.62  
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	53.7M	14,171.2K	\$229,691.9M	98.61%	94.56%
Ind	0.0M	24.2K	\$2,048.1M	0.17%	0.84%
Com	0.0M	175.4K	\$11,160.3M	1.22%	4.59%

### Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	1,134.8M	\$199,023.3M	79	\$214
Res	1,095.2M	\$189,496.3M	77	\$210
Ind	6.8M	\$1,346.8M	281	\$301
Com	32.8M	\$8,180.3M	187	\$341

## Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Nairobi	\$20,928.6M	1,237.5K	4,627.9K	8.62%	8.61%	8.61%
Mandera	\$11,789.2M	697.2K	2,607.4K	4.85%	4.85%	4.85%
Nakuru	\$10,471.7M	619.3K	2,316.1K	4.31%	4.31%	4.31%
Kakamega	\$9,771.1M	577.9K	2,161.2K	4.02%	4.02%	4.02%
Kiambu	\$8,689.5M	513.9K	1,922.1K	3.58%	3.58%	3.58%
Bungoma	\$7,958.1M	470.7K	1,760.3K	3.28%	3.28%	3.28%
Wajir	\$7,591.3M	449.0K	1,679.2K	3.13%	3.12%	3.12%
Meru	\$7,518.1M	444.7K	1,663.1K	3.10%	3.09%	3.09%
Kilifi	\$6,907.3M	408.6K	1,528.0K	2.84%	2.84%	2.84%
Garissa	\$6,827.2M	403.8K	1,510.3K	2.81%	2.81%	2.81%
Kisii	\$6,348.7M	375.5K	1,404.5K	2.61%	2.61%	2.61%
Machakos	\$6,033.8M	356.9K	1,334.9K	2.48%	2.48%	2.48%
Uasin Gishu	\$5,881.4M	347.9K	1,301.1K	2.42%	2.42%	2.42%
Mombasa	\$5,703.8M	337.4K	1,261.9K	2.35%	2.35%	2.35%
Kitui	\$5,591.8M	330.8K	1,237.1K	2.30%	2.30%	2.30%
Narok	\$5,555.9M	328.7K	1,229.1K	2.29%	2.29%	2.29%
Turkana	\$5,443.0M	322.0K	1,204.2K	2.24%	2.24%	2.24%
Kisumu	\$5,421.3M	320.7K	1,199.4K	2.23%	2.23%	2.23%
Homa Bay	\$5,360.0M	317.1K	1,185.9K	2.21%	2.21%	2.21%
Trans Nzoia	\$5,330.4M	315.3K	1,179.3K	2.19%	2.19%	2.19%
Migori	\$5,077.0M	300.4K	1,123.3K	2.09%	2.09%	2.09%
Kericho	\$4,969.1M	294.0K	1,099.5K	2.05%	2.05%	2.05%
Nandi	\$4,938.6M	292.2K	1,092.7K	2.03%	2.03%	2.03%
Murang`a	\$4,936.6M	292.1K	1,092.3K	2.03%	2.03%	2.03%
Makueni	\$4,934.3M	291.9K	1,091.8K	2.03%	2.03%	2.03%
Bomet	\$4,771.6M	282.3K	1,055.8K	1.96%	1.96%	1.96%
Siaya	\$4,703.2M	278.3K	1,040.6K	1.94%	1.94%	1.94%
Kajiado	\$4,402.1M	260.5K	974.0K	1.81%	1.81%	1.81%
Busia	\$4,295.3M	254.2K	950.5K	1.77%	1.77%	1.77%
Kwale	\$3,734.1M	221.0K	826.6K	1.54%	1.54%	1.54%
Nyeri	\$3,665.1M	216.9K	811.4K	1.51%	1.51%	1.51%
Baringo	\$3,580.8M	212.0K	792.7K	1.47%	1.47%	1.48%
Nyamira	\$3,414.2M	202.1K	755.9K	1.41%	1.41%	1.41%
West Pokot	\$3,334.5M	197.4K	738.3K	1.37%	1.37%	1.37%
Vihiga	\$3,195.5M	189.2K	707.5K	1.32%	1.32%	1.32%
Nyandarua	\$3,165.8M	187.4K	700.9K	1.30%	1.30%	1.30%
Embu	\$2,836.1M	167.9K	628.0K	1.17%	1.17%	1.17%
Kirinyaga	\$2,784.6M	164.9K	616.6K	1.15%	1.15%	1.15%
Laikipia	\$2,633.5M	155.9K	583.1K	1.08%	1.09%	1.09%
Elegeyo-Marakwet	\$2,445.9M	144.8K	541.7K	1.01%	1.01%	1.01%
Tharaka-Nithi	\$1,940.8M	114.9K	429.9K	0.80%	0.80%	0.80%
Tana River	\$1,749.9M	103.7K	387.7K	0.72%	0.72%	0.72%
Taita Taveta	\$1,717.0M	101.7K	380.4K	0.71%	0.71%	0.71%
Marsabit	\$1,605.4M	95.1K	355.8K	0.66%	0.66%	0.66%
Samburu	\$1,453.4M	86.2K	322.2K	0.60%	0.60%	0.60%
Isiolo	\$874.9M	52.0K	194.5K	0.36%	0.36%	0.36%
Lamu	\$619.2M	36.9K	137.9K	0.25%	0.26%	0.26%

## Exposure by simplified taxonomy

Adding `MACRO_TAXO` column						
	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
MUR	\$89,926.2M	4,603.9K	17,246.7K	37.02%	32.04%	32.09%
ADO/E	\$60,780.1M	4,465.7K	16,529.3K	25.02%	31.07%	30.76%
W	\$59,064.9M	3,302.1K	12,399.6K	24.32%	22.98%	23.07%
RC	\$16,943.9M	364.8K	1,664.4K	6.98%	2.54%	3.10%
MCF	\$8,394.3M	254.6K	969.1K	3.46%	1.77%	1.80%
OT	\$7,075.1M	1,373.7K	4,935.5K	2.91%	9.56%	9.18%
S	\$715.7M	6.1K	0.0K	0.29%	0.04%	0.00%

## Exposure by taxonomy

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

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
ADO/E	E+ETO/LWAL+CDN/H:1/RES	\$21,656.2M	2,102,445	9.98%	15.23%
	MUR+ADO/LWAL+CDN/H:2/RES	\$18,612.5M	891,495	8.57%	6.46%
MUR	MUR+CB/LWAL+CDN/H:2/RES	\$14,731.9M	635,058	6.79%	4.60%
W	W/LWAL+CDL/H:2/RES	\$13,782.6M	495,113	6.35%	3.59%
	W+WWD/LWAL+CDN/H:1/RES	\$13,113.0M	1,273,047	6.04%	9.22%
ADO/E	MUR+ADO/LWAL+CDN/H:1/RES	\$11,301.9M	914,351	5.21%	6.62%
W	W+WWD/LWAL+CDN/H:2/RES	\$9,255.1M	531,947	4.26%	3.85%
MUR	MUR+CB/LWAL+CDN/H:1/RES	\$8,945.5M	651,336	4.12%	4.72%
W	W/LWAL+CDL/H:3/RES	\$8,466.5M	197,831	3.90%	1.43%
	W/LWAL+CDL/H:1/RES	\$8,369.0M	507,803	3.85%	3.68%
MUR	MUR+CL/LWAL+CDN/H:2/RES	\$7,862.3M	338,922	3.62%	2.46%
OT	ME+MEO/LWAL+CDN/H:1/RES	\$6,837.6M	1,327,623	3.15%	9.62%
MUR	MUR+STDRE+MOC/LWAL+CDN/H:2/RES	\$6,789.8M	292,689	3.13%	2.12%
	MUR+STDRE+MOL/LWAL+CDN/H:2/RES	\$6,789.8M	292,689	3.13%	2.12%
RC	MUR+CL/LWAL+CDN/H:1/RES	\$4,774.1M	347,619	2.20%	2.52%
	CR/LFINF+CDL/H:3/RES	\$4,679.3M	92,938	2.16%	0.67%
MUR	MUR+STDRE+MOC/LWAL+CDN/H:1/RES	\$4,122.9M	300,196	1.90%	2.17%
	MUR+STDRE+MOL/LWAL+CDN/H:1/RES	\$4,122.9M	300,196	1.90%	2.17%
RC	CR/LFINF+CDL/H:2/RES	\$3,808.8M	116,304	1.75%	0.84%
MUR	MUR+STRUB+MOC/LWAL+CDN/H:2/RES	\$3,771.9M	203,247	1.74%	1.47%
	MUR+STRUB+MOL/LWAL+CDN/H:2/RES	\$3,771.9M	203,247	1.74%	1.47%
MCF	MUR+STRUB+MOM/LWAL+CDN/H:2/RES	\$3,771.9M	203,247	1.74%	1.47%
	MCF+CB/LWAL+CDL/H:2/RES	\$3,121.8M	89,715	1.44%	0.65%
W	W+WLI/LWAL+CDL/H:1/RES	\$2,938.3M	208,001	1.35%	1.51%
ADO/E	MUR+ADO/LWAL+CDN/HBET:3-6/RES	\$2,460.7M	12,030	1.13%	0.09%
	EWV/LN+CDN/H:1/RES	\$2,393.5M	464,746	1.10%	3.37%
MUR	MUR+STRUB+MOC/LWAL+CDN/H:1/RES	\$2,290.4M	208,458	1.05%	1.51%
	MUR+STRUB+MOL/LWAL+CDN/H:1/RES	\$2,290.4M	208,458	1.05%	1.51%
RC	MUR+STRUB+MOM/LWAL+CDN/H:1/RES	\$2,290.4M	208,458	1.05%	1.51%
	CR/LFINF+CDL/HBET:4-7/RES	\$2,087.8M	4,261	0.96%	0.03%
ADO/E	MUR+ADO/LWAL+CDN/H:2/COM	\$2,048.4M	26,499	0.94%	0.19%
	MUR+ADO/LWAL+CDN/H:1/COM	\$1,995.0M	52,999	0.92%	0.38%
MUR	MUR+CB/LWAL+CDN/HBET:3-6/RES	\$1,947.7M	8,580	0.90%	0.06%
MCF	MCF+CB/LWAL+CDL/H:1/RES	\$1,895.6M	92,014	0.87%	0.67%