

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 = "Botswana"
```

Exposure files:
Exposure_Com_Botswana.csv
Exposure_Ind_Botswana.csv
Exposure_Res_Botswana.csv

Sanity checks and formats

Botswana
Exposure/Exposure/Exposure_Com_Botswana.csv
Exposure/Exposure/Exposure_Ind_Botswana.csv
Exposure/Exposure/Exposure_Res_Botswana.csv
Occupants / Dwellings = 3.4
Reference avg household size (2019) = 3.51
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 | 2,351.3K | 599.5K | \$19,686.3M | 96.63% | 88.33% |
| Ind | 0.0K | 5.3K | \$719.5M | 0.85% | 3.23% |
| Com | 0.0K | 15.7K | \$1,881.5M | 2.52% | 8.44% |

Other metrics to consider

| | AREA_SQM | COST_BUILDING_USD | AVG_BUILDING_AREA_SQM | AVG_COST_PER_AREA_USD |
|-----------|-----------|-------------------|-----------------------|-----------------------|
| OCCUPANCY | | | | |
| Total | 58,279.3K | \$17,638.3M | 94 | \$382 |
| Res | 53,496.0K | \$15,911.7M | 89 | \$368 |
| Ind | 1,494.7K | \$429.6M | 284 | \$481 |
| Com | 3,288.5K | \$1,297.1M | 210 | \$572 |

Exposure summary at Admin level 1

| | COST_USD | BUILDINGS | OCCUPANTS | COST_USD_% | BUILDINGS_% | OCCUPANTS_% |
|---------------------|------------|-----------|-----------|------------|-------------|-------------|
| NAME_1 | | | | | | |
| Central District | \$6,746.8M | 187.7K | 711.2K | 30.27% | 30.25% | 30.25% |
| Kweneng District | \$4,121.3M | 114.7K | 434.5K | 18.49% | 18.48% | 18.48% |
| South-East District | \$3,239.7M | 90.2K | 341.7K | 14.54% | 14.53% | 14.53% |
| Southern District | \$2,413.4M | 67.2K | 254.6K | 10.83% | 10.83% | 10.83% |
| North-West District | \$1,691.9M | 47.1K | 178.6K | 7.59% | 7.59% | 7.59% |
| North-East District | \$1,631.3M | 45.4K | 172.2K | 7.32% | 7.32% | 7.32% |
| Kgatlang District | \$1,111.1M | 31.0K | 117.3K | 4.99% | 4.99% | 4.99% |
| Kgalagadi District | \$549.6M | 15.4K | 58.2K | 2.47% | 2.48% | 2.47% |
| Ghanzi District | \$516.2M | 14.4K | 54.6K | 2.32% | 2.32% | 2.32% |
| Chobe District | \$265.8M | 7.5K | 28.4K | 1.19% | 1.21% | 1.21% |

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

| | COST_USD | BUILDINGS | OCCUPANTS | COST_USD_% | BUILDINGS_% | OCCUPANTS_% |
|------------|-------------|-----------|-----------|------------|-------------|-------------|
| MACRO_TAXO | | | | | | |
| MUR | \$11,297.4M | 366,507 | 1,287.5K | 50.69% | 59.07% | 54.76% |
| RC | \$3,668.1M | 23,093 | 203.9K | 16.46% | 3.72% | 8.67% |
| ADO/E | \$3,523.1M | 146,422 | 525.9K | 15.81% | 23.60% | 22.37% |
| MCF | \$3,052.9M | 45,546 | 203.9K | 13.70% | 7.34% | 8.67% |
| W | \$375.3M | 18,213 | 63.3K | 1.68% | 2.94% | 2.69% |
| S | \$227.2M | 1,319 | 0.0K | 1.02% | 0.21% | 0.00% |
| OT | \$143.2M | 19,366 | 66.8K | 0.64% | 3.12% | 2.84% |

Exposure by taxonomy

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

| | | COST_USD | BUILDINGS | COST_USD_% | BUILDINGS_% |
|------------|-------------------------------|------------|-----------|------------|-------------|
| MACRO_TAXO | TAXONOMY | | | | |
| MUR | MUR+CB/LWAL+CDN/H:2/RES | \$2,861.5M | 86,532 | 14.29% | 15.63% |
| | MUR+CL/LWAL+CDN/H:2/RES | \$2,861.5M | 86,532 | 14.29% | 15.63% |
| RC | CR/LFINF+CDL/HBET:4-7/RES | \$1,756.4M | 2,504 | 8.77% | 0.45% |
| MUR | MUR+CB/LWAL+CDN/H:1/RES | \$1,737.5M | 88,747 | 8.68% | 16.03% |
| | MUR+CL/LWAL+CDN/H:1/RES | \$1,737.5M | 88,747 | 8.68% | 16.03% |
| ADO/E | MUR+ADO/LWAL+CDN/H:2/RES | \$1,687.2M | 56,273 | 8.42% | 10.17% |
| MCF | MCF/LWAL+CDL/HBET:3-6/RES | \$1,103.8M | 2,256 | 5.51% | 0.41% |
| | MCF/LWAL+CDL/H:2/RES | \$1,025.4M | 20,518 | 5.12% | 3.71% |
| ADO/E | MUR+ADO/LWAL+CDN/H:1/RES | \$1,024.5M | 57,713 | 5.12% | 10.43% |
| MCF | MCF/LWAL+CDL/H:1/RES | \$622.6M | 21,044 | 3.11% | 3.80% |
| RC | CR/LFINF+CDL/H:3/RES | \$506.1M | 7,027 | 2.53% | 1.27% |
| | CR/LFINF+CDL/HBET:8+/RES | \$494.0M | 563 | 2.47% | 0.10% |
| MUR | MUR+CB/LWAL+CDN/HBET:3-6/RES | \$378.3M | 1,168 | 1.89% | 0.21% |
| | MUR+CL/LWAL+CDN/HBET:3-6/RES | \$378.3M | 1,168 | 1.89% | 0.21% |
| RC | CR/LFINF+CDL/H:2/RES | \$274.6M | 5,861 | 1.37% | 1.06% |
| MUR | MUR+CB/LWAL+CDN/H:2/COM | \$234.0M | 1,676 | 1.17% | 0.30% |
| | MUR+CL/LWAL+CDN/H:2/COM | \$234.0M | 1,676 | 1.17% | 0.30% |
| ADO/E | E+ETO/LWAL+CDN/H:1/RES | \$233.3M | 15,770 | 1.16% | 2.85% |
| MUR | MUR+CB/LWAL+CDN/H:1/COM | \$227.9M | 3,355 | 1.14% | 0.61% |
| | MUR+CL/LWAL+CDN/H:1/COM | \$227.9M | 3,355 | 1.14% | 0.61% |
| ADO/E | MUR+ADO/LWAL+CDN/HBET:3-6/RES | \$223.1M | 762 | 1.11% | 0.14% |
| RC | CR/LFINF+CDL/HBET:4-7/COM | \$199.4M | 224 | 1.00% | 0.04% |