

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 = "Thailand"
```

Exposure files:
Exposure_Com_Thailand.csv
Exposure_Ind_Thailand.csv
Exposure_Res_Thailand.csv

Sanity checks and formats

Thailand
Exposure/Exposure/Exposure_Com_Thailand.csv
Exposure/Exposure/Exposure_Ind_Thailand.csv
Exposure/Exposure/Exposure_Res_Thailand.csv
Occupants / Dwellings = 3.3
No refence household size data available
Population (exposure / UN_2021) = 0.95
Exposure models OK

Exposure at National level

Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	66.4M	16,697.0K	\$1,062.2B	90.99%	80.32%
Ind	0.0M	456.8K	\$116.7B	2.49%	8.83%
Com	0.0M	1,197.0K	\$143.5B	6.52%	10.85%

Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	1,905.5M	\$931.0B	104	\$694
Res	1,635.6M	\$789.0B	98	\$649
Ind	112.4M	\$55.3B	246	\$1,039
Com	157.5M	\$86.8B	132	\$911

Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Bangkok	\$261,347.1M	1,656.1K	8,305.2K	19.76%	9.02%	12.50%
Chiang Mai	\$43,908.2M	557.2K	1,737.0K	3.32%	3.04%	2.61%
Samut Prakan	\$42,879.9M	456.9K	1,828.7K	3.24%	2.49%	2.75%
Chon Buri	\$40,869.9M	414.7K	1,555.4K	3.09%	2.26%	2.34%
Nakhon Ratchasima	\$39,598.2M	719.7K	2,526.0K	2.99%	3.92%	3.80%
Pathum Thani	\$35,890.1M	356.8K	1,327.1K	2.71%	1.94%	2.00%
Khon Kaen	\$35,708.9M	536.9K	1,742.0K	2.70%	2.93%	2.62%
Ubon Ratchathani	\$27,506.7M	486.6K	1,746.8K	2.08%	2.65%	2.63%
Nonthaburi	\$27,270.4M	309.1K	1,334.1K	2.06%	1.68%	2.01%
Songkhla	\$25,069.5M	365.4K	1,481.0K	1.90%	1.99%	2.23%
Nakhon Si Thammarat	\$24,902.6M	438.3K	1,450.5K	1.88%	2.39%	2.18%
Chiang Rai	\$24,091.9M	398.9K	1,172.9K	1.82%	2.17%	1.77%
Surin	\$21,673.9M	350.1K	1,122.9K	1.64%	1.91%	1.69%
Phra Nakhon Si Ayutthaya	\$21,627.2M	223.9K	870.7K	1.64%	1.22%	1.31%
Buri Ram	\$20,182.8M	367.8K	1,274.9K	1.53%	2.00%	1.92%
Roi Et	\$19,628.2M	331.1K	1,085.0K	1.48%	1.80%	1.63%
Udon Thani	\$19,385.1M	361.2K	1,288.4K	1.47%	1.97%	1.94%
Samut Sakhon	\$19,367.1M	214.3K	887.2K	1.46%	1.17%	1.34%
Nakhon Sawan	\$18,605.8M	322.2K	992.7K	1.41%	1.76%	1.49%
Surat Thani	\$18,574.4M	287.4K	1,009.4K	1.40%	1.57%	1.52%
Nakhon Pathom	\$18,130.7M	246.6K	943.9K	1.37%	1.34%	1.42%
Phitsanulok	\$17,458.6M	300.9K	912.8K	1.32%	1.64%	1.37%
Si Sa Ket	\$16,941.0M	305.0K	1,056.0K	1.28%	1.66%	1.59%
Maha Sarakham	\$15,938.9M	247.1K	827.6K	1.21%	1.35%	1.25%
Rayong	\$15,703.8M	220.7K	821.1K	1.19%	1.20%	1.24%
Kalasin	\$15,689.8M	258.3K	824.5K	1.19%	1.41%	1.24%
Chaiyaphum	\$15,363.4M	300.7K	963.9K	1.16%	1.64%	1.45%
Sakon Nakhon	\$14,939.7M	288.8K	941.8K	1.13%	1.57%	1.42%
Phetchabun	\$14,789.7M	275.1K	940.1K	1.12%	1.50%	1.42%
Lampang	\$14,382.8M	244.2K	743.1K	1.09%	1.33%	1.12%
Kamphaeng Phet	\$13,510.7M	243.9K	797.4K	1.02%	1.33%	1.20%
Ratchaburi	\$13,402.6M	227.5K	796.7K	1.01%	1.24%	1.20%
Kanchanaburi	\$13,105.6M	210.2K	801.5K	0.99%	1.15%	1.21%
Suphan Buri	\$12,671.2M	245.6K	845.6K	0.96%	1.34%	1.27%
Lop Buri	\$12,575.5M	227.7K	769.9K	0.95%	1.24%	1.16%
Phuket	\$11,649.4M	122.5K	525.7K	0.88%	0.67%	0.79%
Chachoengsao	\$10,949.2M	188.1K	715.6K	0.83%	1.02%	1.08%
Lamphun	\$10,754.8M	139.3K	412.7K	0.81%	0.76%	0.62%
Saraburi	\$10,754.2M	189.2K	717.1K	0.81%	1.03%	1.08%
Trang	\$10,738.5M	174.3K	598.9K	0.81%	0.95%	0.90%
Sukhothai	\$10,649.9M	206.0K	629.7K	0.81%	1.12%	0.95%
Nong Khai	\$10,160.1M	195.2K	821.5K	0.77%	1.06%	1.24%
Nakhon Phanom	\$9,874.9M	168.2K	583.7K	0.75%	0.92%	0.88%
Phrae	\$9,344.5M	160.2K	427.4K	0.71%	0.87%	0.64%
Sa Kaeo	\$9,329.6M	176.3K	556.0K	0.71%	0.96%	0.84%
Prachin Buri	\$9,294.2M	172.1K	547.0K	0.70%	0.94%	0.82%
Narathiwat	\$8,980.6M	159.8K	670.0K	0.68%	0.87%	1.01%
Yasothon	\$8,857.1M	156.5K	488.0K	0.67%	0.85%	0.73%
Phayao	\$8,613.5M	146.0K	417.4K	0.65%	0.80%	0.63%
Prachuap Khiri Khan	\$8,592.0M	132.4K	467.5K	0.65%	0.72%	0.70%
Tak	\$8,372.7M	151.5K	526.4K	0.63%	0.83%	0.79%
Phichit	\$8,334.6M	155.4K	548.2K	0.63%	0.85%	0.83%
Uttaradit	\$8,324.8M	147.4K	438.6K	0.63%	0.80%	0.66%
Chanthaburi	\$8,185.9M	136.2K	485.6K	0.62%	0.74%	0.73%
Chumphon	\$8,180.2M	140.6K	467.8K	0.62%	0.77%	0.70%
Pattani	\$8,158.8M	144.4K	609.0K	0.62%	0.79%	0.92%
Nan	\$8,028.3M	147.6K	452.8K	0.61%	0.80%	0.68%
Phetchaburi	\$7,994.6M	140.6K	472.6K	0.60%	0.77%	0.71%
Loei	\$7,948.3M	154.3K	546.0K	0.60%	0.84%	0.82%
Nong Bua Lam Phu	\$7,786.2M	140.8K	486.0K	0.59%	0.77%	0.73%
Phatthalung	\$7,708.2M	137.8K	481.0K	0.58%	0.75%	0.72%
Krabi	\$5,935.7M	105.1K	362.2K	0.45%	0.57%	0.55%
Yala	\$5,764.7M	103.1K	433.2K	0.44%	0.56%	0.65%
Mukdahan	\$5,571.4M	92.3K	357.3K	0.42%	0.50%	0.54%
Chai Nat	\$5,319.3M	96.8K	305.6K	0.40%	0.53%	0.46%
Uthai Thani	\$5,175.9M	98.2K	297.5K	0.39%	0.54%	0.45%
Amnat Charoen	\$4,838.3M	86.8K	283.7K	0.37%	0.47%	0.43%
Satun	\$4,784.6M	76.7K	274.9K	0.36%	0.42%	0.41%
Phangnga	\$4,699.7M	77.0K	258.5K	0.36%	0.42%	0.39%
Ang Thong	\$4,464.6M	78.6K	254.3K	0.34%	0.43%	0.38%
Bueng Kan	\$4,442.8M	86.5K	452.0K	0.34%	0.47%	0.68%
Nakhon Nayok	\$4,059.1M	74.0K	246.9K	0.31%	0.40%	0.37%
Ranong	\$4,016.1M	64.0K	249.0K	0.30%	0.35%	0.37%
Sing Buri	\$3,570.3M	59.9K	200.0K	0.27%	0.33%	0.30%
Mae Hong Son	\$3,419.9M	64.2K	209.2K	0.26%	0.35%	0.31%
Trat	\$3,368.5M	58.5K	247.9K	0.25%	0.32%	0.37%
Samut Songkhram	\$2,730.2M	49.7K	185.6K	0.21%	0.27%	0.28%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						

RC	\$728,378.7M	4,612.7K	21,615.0K	55.08%	25.14%	32.54%
W	\$202,128.4M	4,888.4K	15,831.1K	15.28%	26.64%	23.83%
MIX	\$182,027.7M	4,624.5K	15,231.6K	13.76%	25.20%	22.93%
MUR	\$167,592.9M	3,986.3K	13,288.9K	12.67%	21.72%	20.00%
S	\$37,456.4M	112.0K	0.0K	2.83%	0.61%	0.00%
OT	\$4,834.2M	126.9K	467.1K	0.37%	0.69%	0.70%

Exposure by taxonomy

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

	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MACRO_TAXO	TAXONOMY			
W	W+WO/LN/H:1/RES	\$143.9B	3,759,212	12.10%
MIX	MIX(M-W)/RES	\$140.7B	3,674,766	11.83%
	CR/LFINF+DUL/H:2/RES	\$97.5B	1,219,370	8.20%
RC	CR/LFINF+DUL/H:4/RES	\$73.7B	51,183	6.20%
	CR/LFINF+DUL/H:5/RES	\$71.2B	31,666	5.99%
MUR	MUR/LWAL+DNO/H:2/RES	\$70.6B	1,492,162	5.93%
	CR/LFINF+DUL/H:1/RES	\$65.3B	1,223,931	5.49%
RC	CR/LFM+DUL/HBET:1-2/IND1	\$63.0B	73,604	5.29%
	CR/LFINF+DUL/H:3/RES2	\$56.1B	350,844	4.72%
	CR/LFINF+DUL/H:2/RES2	\$52.2B	489,549	4.39%
MUR	MUR/LWAL+DNO/H:1/RES	\$47.0B	1,491,154	3.95%
RC	CR/LFINF+DUL/H:1/RES2	\$44.5B	416,748	3.74%
S	S/LFM+DUL/HBET:1-2/IND1	\$31.0B	31,362	2.61%
MIX	MIX(CR-W)/RES	\$29.9B	780,849	2.51%
RC	CR/LFINF+DUL/H:3/RES	\$25.5B	159,410	2.14%
W	W/H:2/RES	\$24.9B	372,014	2.10%
RC	CR/LDUAL+DUL/HBET:13-/COM12	\$22.5B	2,252	1.89%
	CR/LDUAL+DUL/HBET:6-12/COM3	\$19.7B	3,379	1.66%
W	W/H:1/RES	\$16.6B	372,063	1.40%
MUR	MUR/LWAL+DNO/H:1/RES2	\$15.9B	251,479	1.33%
	MUR/LWAL+DNO/H:2/RES2	\$15.9B	251,400	1.33%
	CR/LFINF+DUM/H:5/RES	\$14.6B	6,468	1.22%
	CR/LDUAL+DUL/HBET:6-12/RES	\$13.6B	2,092	1.14%
RC	CR/LDUAL+DUL/HBET:6-12/COM12	\$12.8B	1,280	1.08%
	CR/LFINF+DUM/H:4/RES	\$11.2B	7,800	0.94%
	CR/LDUAL+DUM/HBET:6-12/RES	\$9.8B	1,512	0.82%