

Population Dataset in Vietnam (2000–2019)

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Abstract: Vietnam, as the third most populous country in Southeast Asia, is one of the key-node countries along the Green Silk Road. Population dataset in Vietnam (2000–2019) was developed based on the demographic data, LandScan population grid data from 2000 to 2019, geographical zone data, as well as Vietnam administrative division and their adjustment data. The dataset includes three levels: whole country, six geographical regions, and 63 provinces (cities), and the time span is 2000–2019. The dataset is archived in .shp and .xlsx data formats, and consists of 8 data files with data size of 1.41 MB (compressed into one data file, 884 KB).

Keywords: population distribution; Vietnam; provincial level; dataset; the Belt and Road Initiative

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CSTR: <https://cstr.science.org.cn/CSTR:20146.14.2022.01.01>

Dataset Availability Statement:

The dataset supporting this paper was published and is accessible through the *Digital Journal of Global Change Data Repository* at: <https://doi.org/10.3974/geodb.2021.06.04.V1> or <https://cstr.science.org.cn/CSTR:20146.11.2021.06.04.V1>.

1 Introduction

Vietnam, an important land and neighboring country of Lao, Cambodia and China, is one of the key-node countries along the Green Silk Road. With an average growth rate of 6.5% in GDP from 2000 to 2019, Vietnam has become China's largest trading partner among Association of Southeast Asia Nations (ASEAN) countries since 2015^[1]. The fifth census of Vietnam in 2019 showed that the country had a total population of 96,208,984, and would soon become the world's 15th country with a population of over 100 million. Population as the key factor of climate change, disaster risk and epidemic spreading^[2–4], integrating the population distribution datasets, e.g., national, six geographical regions and 63 provinces (cities), is very useful for the development of scientific research on the Vietnam's human-nature interrelationship.

The demographic data from the General Statistics Office of Vietnam from 2000 to 2019,

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[2] Yin, X., Li, P., Feng, Z. M., *et al.* Population dataset in regions of Vietnam (2000–2019) [J/DB/OL]. *Digital Journal of Global Change Data Repository*, 2021. <https://doi.org/10.3974/geodb.2021.06.04.V1>. <https://cstr.science.org.cn/CSTR:20146.11.2021.06.04.V1>.

and supplemented by LandScan^[5,6] dataset of OAK Ridge National Laboratory during the same period, and then used the spatial analysis method of ArcGIS software. Finally, the Population dataset in Vietnam from 2000 to 2019 is integrated.

2 Metadata of the Dataset

The metadata of the Population dataset in regions of Vietnam (2000–2019)^[7] is summarized in Table 1. It includes the dataset full name, short name, authors, year of the dataset, temporal resolution, spatial resolution, data format, data size, data files, data publisher, and data sharing policy, etc.

Table 1 Metadata summary of the Population dataset in regions of Vietnam (2000–2019)

Items	Description
Dataset full name	Population dataset in regions of Vietnam (2000–2019)
Dataset short name	PopulationVietnam_2000-2019
Authors	Yin, X. 0000-0003-2498-4115, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, yinx.19b@igsnrr.ac.cn Li, P. 0000-0002-0849-5955, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, lip@igsnrr.ac.cn Feng, Z. M. M-5550-2018, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, fengzm@igsnrr.ac.cn You, Z. M-5487-2018, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, youz@igsnrr.ac.cn Xiao, C. W. 0000-0003-3477-9406, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, xiaocw@igsnrr.ac.cn
Geographical region	Vietnam
Year	2000–2019
Temporal resolution	Yearly
Spatial resolution	National, geographical regions, and provinces
Data format	.shp, .xlsx
Data size	884 KB (after compression)
Data files	The dataset consists of two parts: (1) Annual population data of Vietnam in .xlsx format for the whole country, six geographic regions and 63 provinces (cities) from 2000 to 2019; (2) Annual population data of Vietnam’s provinces from 2000 to 2019 in shapefile format
Foundations	Chinese Academy of Sciences (XDA20010203, 2020055); National Natural Science Foundation of China (41971242)
Data publisher	Global Change Research Data Publishing & Repository, http://www.geodoi.ac.cn
Address	No. 11A, Datun Road, Chaoyang District, Beijing 100101, China
Data sharing policy	Data from the Global Change Research Data Publishing & Repository includes metadata, datasets (in the <i>Digital Journal of Global Change Data Repository</i>), and publications (in the <i>Journal of Global Change Data & Discovery</i>). Data sharing policy includes: (1) Data are openly available and can be free downloaded via the Internet; (2) End users are encouraged to use Data subject to citation; (3) Users, who are by definition also value-added service providers, are welcome to redistribute Data subject to written permission from the GCdataPR Editorial Office and the issuance of a Data redistribution license; and (4) If Data are used to compile new datasets, the ‘ten per cent principal’ should be followed such that Data records utilized should not surpass 10% of the new dataset contents, while sources should be clearly noted in suitable places in the new dataset ^[8]
Communication and searchable system	DOI, CSTR, Crossref, DCI, CSCD, CNKI, SciEngine, WDS/ISC, GEOSS

3 Methods

3.1 Data Sources

Demographic statistics and administrative divisions (six geographical divisions and 63

provincial administrative units) are all from General Statistics Office of Vietnam¹. Except for the mid-year census data in April 1, 2019, the data in 2000–2018 are all total population at the end of the year. In addition, the vector administrative boundaries of Vietnam's 63 provinces (cities) are derived from Vietnam Open Development Data².

3.2 Data Processing

The data processing includes interpolation of missing values and spatialization of population. First, we interpolated the missing values of some provinces. The problem of missing population values in some provinces is mainly caused by the adjustment of provincial administrative divisions. From 2000 to 2019, Vietnam's provincial units had undergone two adjustments: (1) In 2004, one municipality directly under the central government and two provinces were added. Can Tho city, the capital of Can Tho province in southern Vietnam, was separated out as a municipality directly under the central government, and the remainder of Can Tho province became Hau Giang province. In addition, a part of Lai Chau province is separated out to set up Dien Bien province, and a part of Dak Lak province is separated out to set up Dak Nong province. (2) In 2008, Ha Tay province was merged into the capital, Ha Noi city. Therefore, we employed the “Zonal statistics as table” tool in ArcGIS software to interpolate the missing values, with the specific process as follows: (1) We used the current provincial vector administrative boundaries and LandScan to calculate the total population of Hau Giang, Dien Bien and Dak Nong from 2000 to 2003, and revised by the values of former provinces of Can Tho, Lai Chau and Dak Lak. In the end, we obtained the total population of Hau Giang, Dien Bien and Dak Nong from 2000 to 2003. (2) The population of Ha Tay province before 2008 was merged into that of Ha Noi city. (3) According to the “code” attribute field of 63 provinces (cities) in Vietnam, the vectorized administrative region was linked to the province's population from 2000 to 2019. There are six geographic regions and 63 provincial units in total. Table 2 presented the 63 provincial administrative divisions in Vietnam.

Table 2 Provincial administrative divisions in Vietnam

Geographical Regions (Number)	Provinces (Cities)
Red River Delta (11)	Ha Noi, Vinh Phuc, Bac Ninh, Quang Ninh, Hai Duong, Hai Phong, Hung Yen, Thai Binh, Ha Nam, Nam Dinh, Ninh Binh
Northern midlands and mountain areas (14)	Ha Giang, Cao Bang, Bac Kan, Tuyen Quang, Lao Cai, Yen Bai, Thai Nguyen, Lang Son, Bac Giang, Phu Tho, Dien Bien, Lai Chau, Son La, Hoa Binh
Northern central area and central coastal area (14)	Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Quang Tri, Thua Thien-Hue, Da Nang, Quang Nam, Quang Ngai, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, Binh Thuan
Central highlands (5)	Kon Tum, Gia Lai, Dak Lak, Dak Nong, Lam Dong
South East (6)	Binh Phuoc, Tay Ninh, Binh Duong, Dong Nai, Ba Ria - Vung Tau, Ho Chi Minh city
Mekong River Delta (13)	Long An, Tien Giang, Ben Tre, Tra Vinh, Vinh Long, Dong Thap, An Giang, Kien Giang, Can Tho, Hau Giang, Soc Trang, Bac Lieu, Ca Mau

4 Data Results

The dataset consists of two parts: (1) Land area of Vietnam and six geographic regions as well as annual population of 63 provinces (cities) from 2000 to 2019 in the .xlsx format; (2) Spatial distribution of population of 63 provinces (cities) in Vietnam from 2000 to 2019 in

¹ General Statistics Office of Vietnam. Vietnamese population statistics data from 2000 to 2019 [OL]. 2021-11-11. <https://www.gso.gov.vn>.

² Open Development Vietnam datasets. Provincial administrative boundaries of Vietnam [OL]. 2021-11-11. <https://data.opendevlopmentmekong.net/en/dataset/a-phn-tnh?type=dataset>.

shapefile format.

4.1 National Land Area and Population Change Data

The land area of Vietnam is 329,600 km², ranking 4th in Southeast Asia. Figure 1 shows the total population and population growth rate of Vietnam from 2000 to 2019. Since the 21st century, the population of Vietnam has increased from 77.63 million in 2000 to 96.21 million in 2019, with an average annual growth rate of about 1.20%. If calculated based on an average annual growth rate of 1%, the population of Vietnam will exceed 100 million in 2023, becoming the 15th country with a population of over 100 million in the world. In addition, Vietnam is a country with high population density, which was 290 persons/km² in 2019, a value much higher than the world average of 60 persons/km².

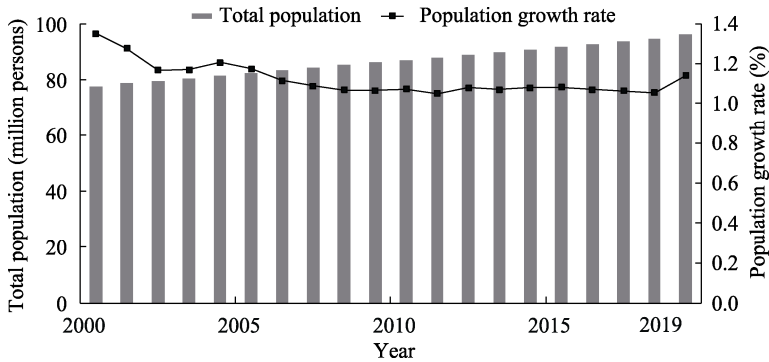


Figure 1 Total population and growth rate from 2000 to 2019 in Vietnam

4.2 Regional Land Area and Population Change Data

Among the six geographic regions of Vietnam, the Northern Central Area and Central Coastal Area and the Northern Midlands and Mountain Areas are the largest two regions with a land area exceeding 90,000 km². While the Red River Delta and the South East are the smallest ones, with a land area of 21,000 km² and 23,000 km², respectively. In terms of total population, the figure for Red River Delta with the largest population exceeded 22 million in 2019, while that for the Central Highlands, the least-populous region, was less than 6 million.

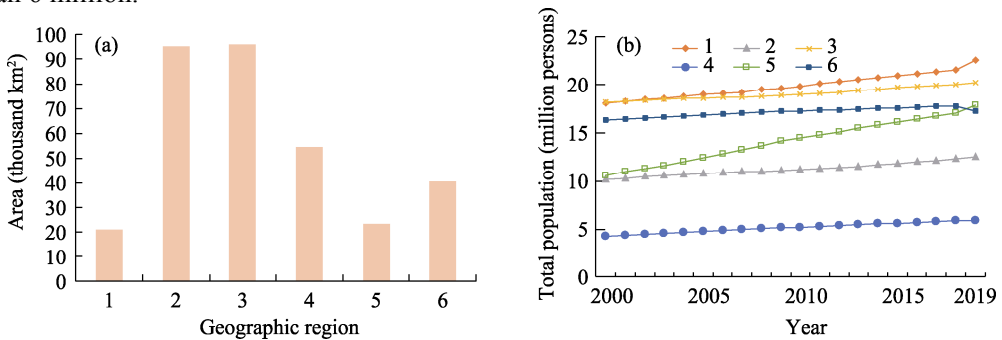


Figure 2 Land area and population of six geographic regions in Vietnam

Notes: Figure 2a shows the land area of Vietnam's six geographic regions, and Figure 2b shows their population change from 2000 to 2019. The figures 1, 2, 3, 4, 5 and 6 represent the Red River Delta, the Northern Midlands and Mountain Areas, the Northern Central Area and Central Coastal Area, the Central Highlands, the South East, and the Mekong River Delta, respectively.

As for the population growth rate, the South East was the fastest-growing region, with an

average annual growth rate of 2.72%, while the Mekong River Delta, which showed the slowest growth, had an average annual growth rate of only 0.48%. As regards the population density, the Red River Delta was the most populous region whose population density exceeded 1,000 persons/km², followed by the South East and Mekong River Delta; while the Northern Midlands and Mountain Areas and Central Highlands were sparsely populated areas, with a population density of less than 150 persons/km² (Figure 2, Table 3).

Table 3 Population characteristics in the six geographic regions of Vietnam in 2000, 2010, and 2019

Geographical regions	2000			2010			2019		
	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)
Red River Delta	1,806.07	1.02	857	1,985.19	1.19	942	2,254.36	1.41	1,070
Northern midlands and mountain areas	1,020.44	1.18	107	1,118.43	1.00	117	1,253.29	1.26	132
Northern central area and central coastal area	1,821.83	0.46	190	1,897.52	0.63	198	2,018.73	0.69	211
Central highlands	424.64	3.67	78	520.44	1.47	95	584.27	1.33	107
South East	1,060.45	3.77	449	1,448.03	2.34	614	1,782.89	2.37	756
Mekong River Delta	1,629.66	0.69	402	1,725.13	0.30	425	1,727.36	0.05	426

4.3 Provincial Land Area and Population Change Data

4.3.1 Land Area and Population Change Data in the Red River Delta

In terms of land area, among the 11 provinces (cities) in the Red River Delta, Quang Ninh province ranks first with an area over 6,100 km², while Bac Ninh and Hung Yen provinces have the smallest areas with less than 1,000 km². Regarding the total population, Ha Noi, the capital city of Vietnam, ranked first with a population of 8.05 million in 2019. Ha Nam and Nam Dinh were the least-populated provinces, both of which had a population less than one million. With regard

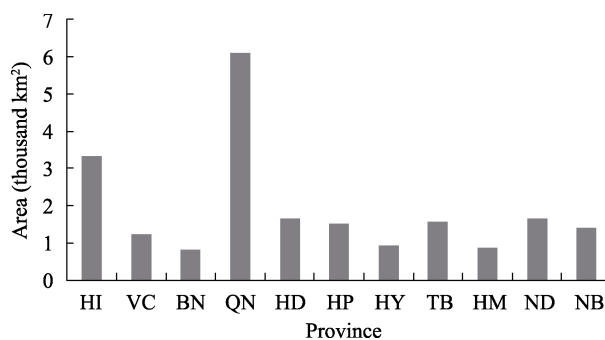


Figure 3 Land area of the 11 provinces (cities) in the Red River Delta

Notes: The HI, VC, BN, QN, HD, HP, HY, TB, HM, ND and NB are the abbreviation of Ha Noi, Vinh Phuc, Bac Ninh, Quang Ninh, Hai Duong, Hai Phong, Hung Yen, Thai Binh, Ha Nam, Nam Dinh and Ninh Binh.

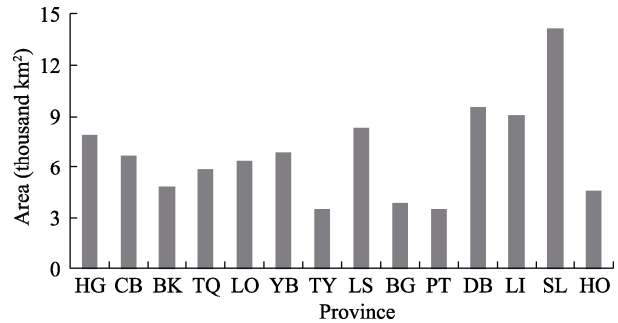
to the population growth rate, Bac Ninh province and Ha Noi city grew most rapidly in population, with an average annual growth exceeding 2%. Nam Dinh was the only province that experienced negative population growth in the Red River Delta. Overall, the population density of this region was relatively high. Among the 11 provinces (cities), Ha Noi city was the most populous, with a population density over 2,400 persons/km², and Quang Ninh province was the least populated one, also with a figure over 200 persons/km² (Figure 3, Table 4).

Table 4 Population characteristics in the provinces of Red River Delta of Vietnam in 2000, 2010, and 2019

Geographical regions	2000			2010			2019		
	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)
Ha Noi	519.79	2.39	1,561	663.36	2.5	1,993	805.37	2.22	2,419
Vinh Phuc	110.41	0.9	893	100.76	0.72	815	115.12	1.41	931
Bac Ninh	95.06	0.81	1,155	104.42	1.72	1,269	136.88	2.90	1,664
Quang Ninh	102.42	1.69	168	115.72	0.97	190	132.03	1.42	216
Hai Duong	165.69	0.36	1,001	171.64	0.56	1,036	189.23	1.04	1,143
Hai Phong	169.15	0.88	1,110	185.78	0.95	1,220	202.85	0.99	1,332
Hung Yen	107.9	0.71	1,165	113.23	0.33	1,223	125.27	1.05	1,353
Thai Binh	178.94	0.07	1,140	178.47	0.09	1,137	186.04	0.43	1,185
Ha Nam	79.38	0.16	922	78.63	0.01	914	85.28	0.84	991
Nam Dinh	188.65	-0.29	1,142	183	0.09	1,108	178.04	-0.26	1,078
Ninh Binh	88.68	0.2	638	90.17	0.23	649	98.25	0.89	707

4.3.2 Land Area and Population Change Data in Provinces of the Northern Midlands and Mountain Areas

In terms of land area, among the 14 provinces in the Northern Midlands and Mountain Areas, Son La province ranks first with an area over 14,000 km², while Thai Nguyen, Phu Tho, and Bac Giang provinces have the smallest areas that are less than 4,000 km². In 2019, the total population of each province in this region were relatively small. Among these provinces, Bac Giang province had the highest population of 1.8 million, and most provinces had a total population of less than one million, among which Bac Kan and Lai Chau had a total population of less than 500,000. In terms of population growth rate, most provinces had a relatively fast population growth rate. The population growth rates of Dien Bien and Lai Chau provinces exceeded 2%, and that of Gao Binh, which was the slowest, also reached 0.4%. The population density of all provinces in this region were relatively low. Approximately 80% of the provinces had a population density of less than 200 persons/km², and the population density of six provinces were less than 100 persons/km² (accounting for 43%) (Figure 4, Table 5).

**Figure 4** Land area of the 14 provinces in the Northern Midlands and Mountain Areas

Notes: The HG, CB, BK, TQ, LO, YB, TY, LS, BG, PT, DB, LI, SL and HO are the abbreviation of Ha Giang, Cao Bang, Bac Kan, Tuyen Quang, Lao Cai, Yen Bai, Thai Nguyen, Lang Son, Bac Giang, Phu Tho, Dien Bien, Lai Chau, Son La and Hoa Binh.

4.3.3 Land Area and Population Change Data in Provinces of the Northern Central Area and Central Coastal Area

In terms of land area, among the 14 provinces (cities) in the Northern Central Area and Central Coastal Area, Nghe An province ranks first with more than 14,000 km², while Da Nang city has the smallest area with less than 1,300 km². In terms of total population, Thanh Hoa and Nghe An had the largest population in 2019, both exceeding three million, while Ninh Thuan and Quang Tri had the smallest population that were only around 600,000.

Table 5 Population characteristics in the provinces of Northern Midlands and Mountain Areas of Vietnam in 2000, 2010, and 2019

Geographical regions	2000			2010			2019		
	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)
Ha Giang	61.92	2.2	78	73.38	1.2	93	85.47	1.65	108
Cao Bang	49.39	0.37	74	51.31	0.37	76	53.03	0.45	79
Bac Kan	27.84	0.72	57	29.75	0.98	61	31.39	0.66	65
Tuyen Quang	68.41	1	117	72.93	0.57	124	78.48	0.8	134
Lao Cai	60.74	1.49	95	62.68	1.79	98	73.04	1.73	114
Yen Bai	68.8	0.86	100	75.13	1.29	109	82.10	1.03	119
Thai Nguyen	105.55	0.73	299	113.13	0.52	320	128.68	1.36	364
Lang Son	70.79	0.28	85	73.63	0.42	88	78.17	0.65	94
Bac Giang	150.27	0.47	391	156.98	0.83	408	180.40	1.49	469
Phu Tho	127.01	0.5	359	132.27	0.46	374	146.37	1.06	414
Dien Bien	37.06	3.29	39	50.12	2.12	52	59.89	2	63
Lai Chau	24.62	3.94	27	38.08	2.53	42	46.02	2.17	51
Son La	90.99	2.64	64	109.89	1.83	78	124.84	1.49	88
Hoa Binh	77.05	1.42	167	79.16	0.66	172	85.41	0.84	185

Table 6 Population characteristics in provinces of the Northern Central Area and Central Coastal Area of Vietnam in 2000, 2010, and 2019

Geographical regions	2000			2010			2019		
	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)
Thanh Hoa	346.82	−0.18	312	342.18	0.51	307	364.01	0.68	327
Nghe An	287.11	0.21	174	293.41	0.67	178	332.78	1.33	202
Ha Tinh	126.84	−0.21	211	123.27	0.4	206	128.89	0.49	215
Quang Binh	80.21	0.79	99	84.86	0.43	105	89.54	0.58	111
Quang Tri	57.76	0.47	122	60.17	0.52	127	63.24	0.55	133
Thua Thien-Hue	105.21	0.29	209	109.09	0.3	217	112.86	0.37	224
Da Nang	70.61	2.74	549	92.27	3.15	718	113.43	2.45	882
Quang Nam	138.25	0.49	132	143.32	0.72	137	149.58	0.5	143
Quang Ngai	119.43	0.2	232	122.1	0.31	237	123.17	0.12	239
Binh Dinh	146.61	0.06	242	149.2	0.31	247	148.69	0	246
Phu Yen	79.96	1.15	158	86.61	0.43	171	87.30	0.12	173
Khanh Hoa	104.96	1.42	201	116.43	0.53	223	123.11	0.62	236
Ninh Thuan	51.67	1.83	154	56.95	0.65	170	59.05	0.44	176
Binh Thuan	106.39	1.24	136	117.68	0.63	151	123.08	0.53	158

In terms of population growth rate, except Da Nang city, which had a faster growth rate of 2.45%, most provinces (accounting for 86%) had an average annual population growth rate

of less than 0.7%. In terms of population density, Da Nang city had the highest population density, exceeding 880 persons/km², whereas Quang Binh province had the lowest population density, which was only 111 persons/km² (Figure 5, Table 6).

4.3.4 Land Area and Population Change Data in Provinces of the Central Highlands

In terms of land area, among the five provinces in the Central Highlands, the two provinces of Gia Lai and Dak Lak have larger land areas, with more than 15,000 km² and 13,000 km², respectively, while Dak Nong province had relatively small area, with only 6,500 km². In terms of total population, Dak Lak province had more than 1.8 million in 2019, while the total population of Kon Tum and Dak Nong provinces were relatively small, which were only about 600,000. The population growth rate of all provinces was relatively fast. The population growth rates of Kon Tum and Dak Nong provinces in 2019 both exceeded 2%, and even that of Dak Lak province, which was the slowest, also exceeded 0.75%. The population density of all provinces were below 150 persons/km², and that of Kon Tum province was less than 60 persons/km² (Figure 6, Table 7).

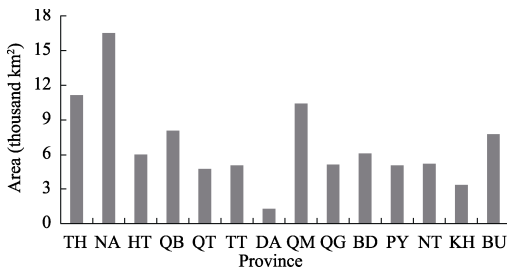


Figure 5 Land area of the 14 provinces (cities) in the northern central area and central coastal area

Notes: The TH, NA, HT, QB, QT, TT, DA, QM, QG, BD, PY, KH, NT and BU are the abbreviation of Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Quang Tri, Thua Thien-Hue, Da Nang, Quang Nam, Quang Ngai, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan and Binh Thuan.

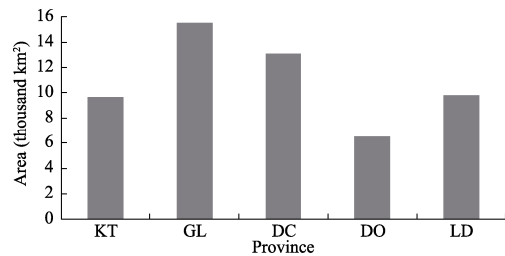


Figure 6 Land area of the five provinces in the central highlands

Notes: The KT, GL, DC, DO and LD are the abbreviation of Kon Tum, Gia Lai, Dak Lak, Dak Nong and Lam Dong.

Table 7 Population characteristics in provinces of the Central Highlands in 2000, 2010, and 2019

Geographical regions	2000			2010			2019		
	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)
Kon Tum	32.81	3.63	34	44.21	2.39	46	54.04	2.28	56
Gia Lai	102.63	4.56	66	130.16	1.61	84	151.38	1.72	97
Dak Lak	140.46	-1.05	107	175.27	0.98	134	186.93	0.75	142
Dak Nong	45.63	0.76	70	50.38	2.61	77	62.22	2.4	95
Lam Dong	103.11	2.64	105	120.41	1.24	123	129.69	0.88	133

4.3.5 Land Area and Population Change Data in Provinces of the South East

In terms of land area, among the six provinces (cities) in the South East, Binh Phuoc province ranks first with more than 7,000 km², while Ba Ria-Vung Tau province and Ho Chi Minh city have the smallest areas of around 2,000 km². In terms of total population, Ho Chi Minh city had the largest population of nearly nine million in 2019, while Binh Phuoc province had the smallest population of less than one million. In terms of population growth

rate, all provinces grew fast, among which Binh Duong province had a population growth rate of nearly 5%, and that of Ho Chi Minh city also exceeded 2%. The population density of all provinces were relatively high. Ho Chi Minh city had a population density of more than 4,200 persons/km², and only Binh Phuoc province had a population density of less than 150 persons/km² (Figure 7, Table 8).

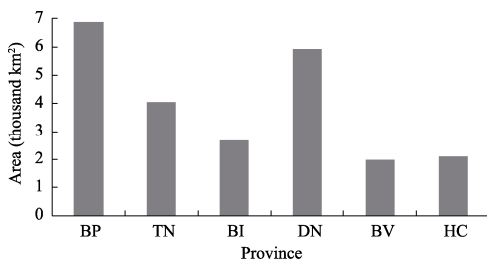


Figure 7 Land area of the six provinces (cities) in the South East

Notes: The BP, TN, BI, DN, BV and HC are the abbreviation of Binh Phuoc, Tay Ninh, Binh Duong, Dong Nai, Ba Ria-Vung Tau and Ho Chi Minh.

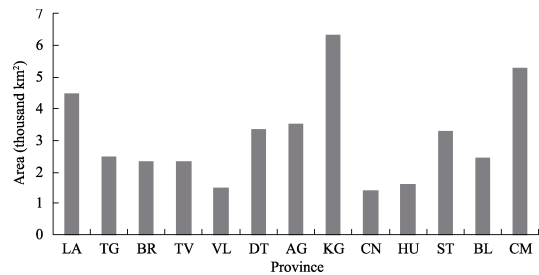


Figure 8 Land area of the 13 provinces (cities) in the Mekong River Delta

Notes: The LA, TG, BR, TV, VL, DT, AG, KG, CN, HU, ST, BL and CM are the abbreviation of Long An, Tien Giang, Ben Tre, Tra Vinh, Vinh Long, Dong Thap, An Giang, Kien Giang, Can Tho, Hau Giang, Soc Trang, Bac Lieu and Ca Mau.

Table 8 Population characteristics in provinces of the South East in 2000, 2010, and 2019

Geographical regions	2000			2010			2019		
	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)
Binh Phuoc	68.29	4.69	99	88.58	1.23	129	99.47	1.3	145
Tay Ninh	98.33	1.58	243	107.43	0.67	266	116.92	0.92	289
Binh Duong	77.94	8.13	289	159.08	5.18	590	242.66	4.93	901
Dong Nai	205.41	2.73	348	257.15	2.87	435	309.71	2.2	524
Ba Ria-Vung Tau	82.99	3.08	417	101.13	1.28	508	114.83	1.42	577
Ho Chi Minh	527.49	3.98	2,517	734.66	2.09	3,506	899.31	2.28	4,291

4.3.6 Land Area and Population Change Data in Provinces of the Mekong River Delta

In terms of land area, among the 13 provinces (cities) in the Mekong River Delta, Kien Giang and Ca Mau province have larger land areas, exceeding 6,000 km² and 5,000 km², respectively, while Can Tho city and Vinh Long province have smaller land areas that are less than 1500 km². Most provinces in this region mainly had a population of one million to two million in 2019, and only the two provinces of Hau Giang and Bac Lieu had a population of less than one million. In terms of population growth rate, most provinces experienced slow growth. Among them, the six provinces of Vinh Long, Dong Thap, An Giang, Hau Giang, Soc Trang and Ca Mau experienced negative population growth (accounting for 46%). The population density of all provinces were relatively high. Can Tho city had a population density of more than 870 persons/km², and even that of Ca Mau province, which was the slowest, was more than 220 persons/km² (Figure 8, Table 9).

Table 9 Population characteristics in provinces of the Mekong River Delta of Vietnam in 2000, 2010, and 2019

Geographical regions	2000			2010			2019		
	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)	Total population (million persons)	Population growth rate (%)	Population density (person /km ²)
Long An	132.71	1.22	295	144.28	0.45	321	168.85	1.62	376
Tien Giang	161.35	0.32	643	167.8	0.31	669	176.42	0.54	703
Ben Tre	129.79	−0.09	550	125.66	0.04	532	128.85	0.26	546
Tra Vinh	97.2	0.3	415	100.8	0.48	431	100.92	0.06	431
Vinh Long	101.34	0.11	677	102.65	0.14	686	102.28	−0.02	683
Dong Thap	158.06	0.79	468	166.96	0.18	494	159.95	−0.41	474
An Giang	206.17	0.31	583	214.83	0.03	607	190.84	−1.16	540
Kien Giang	152.27	1.23	240	169.87	0.6	268	172.31	0.2	271
Can Tho	109.84	0.77	780	119.79	0.78	850	123.52	0.39	877
Hau Giang	73.23	0.82	457	75.98	0.24	474	73.30	−0.33	457
Soc Trang	119.34	1.32	360	129.56	0.19	391	119.97	−0.75	362
Bac Lieu	74.97	1.56	304	86.1	0.49	349	90.72	0.58	367
Ca Mau	113.39	0.93	214	120.85	0.12	228	119.45	−0.1	226

4.4 Spatio-temporal Data of 63 Provinces (Cities) in Vietnam from 2000 to 2019

Figure 9 shows the provincial spatial distribution of population in Vietnam from 2000 to 2019. Overall, the Red River Delta in the north and the Mekong River Delta in the south are two densely populated areas, while the Truong Son Mountains in the central region is sparsely populated. For 63 provinces (cities), most provinces in Vietnam have a population of one million to two million, while the population of Ho Chi Minh city and Ha Noi city, the first and second populous province-level units, reaches 8.99 million and 8.05 million, respectively. The least-populous province is Bac Kan in the north, with a total population of only 0.31 million.

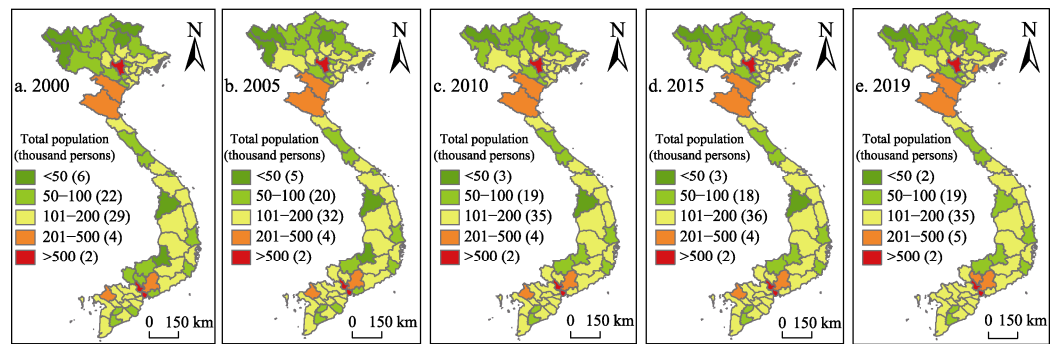


Figure 9 Provincial spatial distribution of population in Vietnam from 2000 to 2019
Note: The number in the parentheses indicates the number of provinces under the classification.

5 Discussion and Conclusion

This dataset collected the demographic data on the website of the General Statistics Office of Vietnam from 2000 to 2019, and used the ArcGIS software to vectorize the population

data in the provincial-level, and finally integrated the population dataset in Vietnam from 2000 to 2019. This dataset can provide data support for the research on the Vietnam's human-nature interrelationship, such as climate change, disaster risk and epidemic spreading.

Author Contributions

Yin, X. was primarily responsible for the dataset design, model calculation, and manuscript writing. Feng, Z. M. designed the algorithms of dataset. Li, P., You, Z., and Xiao, C. W. contributed to the data processing and analysis.

Conflicts of Interest

The authors declare no conflicts of interest.

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