Impacts of Urbanization on the Environment of Ho Chi Minh City

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Abstract. Urbanization has created a premise for industrialization and this process has accelerated urbanization at a faster pace. The fact that the reverse of industrialization along with the urbanization's downside creates challenges that is not easily overcome. Urbanization in Ho Chi Minh City seems to be faster than the industrialization process and has two-sided effects on socio-economic development. And what makes many people worried is its impact on the environment, the air quality, the water that used to be very fresh. The article focuses on the development of the city and some of its implications, from which to give a few suitable suggestions.

1. Introduction
With an extremely favorable geo-economic position in terms of trade development, Ho Chi Minh City has a remarkable development in the field of economy; this process also takes place relatively early and very quickly. It is also the largest city in Vietnam, with a very young history of establishment and development, but now is the region with the most dynamic economy in the country. It is also the major cultural center and the leading economic center of the country. According to Statistics, the population of Ho Chi Minh City as of January 23, 2019 was 8,859,688, an increase of 64,823 compared to June 30, 2018. Thus, over a period of 10 years, from 2009-2019, the average population growth rate of the city. Ho Chi Minh City is 2.15% / year. On average, the city increases by 170,000 people a year, nearly the size of a small district in the city. In 2018, Ho Chi Minh City attracted US $ 7.07 billion of foreign investment, the highest and accounted for 22% of the country's total foreign investment. It is ranked “amongst the top five cities in terms of the largest exposed population by the year 2070” [1]. With the growth rate of the gross domestic product is estimated at 8.3%, GDP accounts for 23.97% compared to the national economic scale. In addition to the hot and hot weather with high UV index exceeding the threshold, air quality is also alarming; the environment affects urban development and above all people's health.

2. Research content
2.1 Urbanization of the world
According to a recent report of the United Nations Population Program, in 1800 only about 2% of the world's population lived in urban areas, by 1950, this proportion reached about 30%. Today, about half of the planet's population is in towns and every day 180,000 more immigrants enter the cities. By 2050, the urban population will account for two-thirds of the global population and 80% of the GDP of the entire world economy. According to the report, 20% of the world's population currently lives and works in the 600 largest cities on the planet with 60% of global GDP. Especially, developing countries are undergoing “rapid urbanization combined with globalization and urbanization” [2].
Figure 1 shows that population in rural areas and urban population ratios from 1950 one billion in 1950 to 4 billion in 2015 and nearly 7 billion by 2050. Today, about half of the planet's population is towns and every day 180,000 more immigrants enter the cities. Cities are growing bigger and bigger by “big immigrants”. Urbanization has been taking place across continents. The history of this process shows that mankind is paying the price for its mistakes and many countries behind it still fall into the “traps” that many of the former countries have encountered [2].

2.2 The process of urbanization in Ho Chi Minh City - an issue of Vietnam after 1975
After “Doi Moi” policy in 1986, many people migrated from rural to urban areas in search of higher paying jobs. From the 1990s to the early 2000s, migration to the city increased rapidly with the development of industry and services. Where there is economic activity, there will gradually attract more manpower and most of these areas are located on the outskirts of the city. This human resource not only includes rural-to-urban migration but also urban-to-suburban migration. This causes pressure on infrastructure and the authorities cannot immediately solve these problems due to lack of budget. However, rapid urbanization also makes the city face to many problems.

April 30, 1975, with the victory of Ho Chi Minh campaign, the country of Vietnam was unified. The process of urbanization in Ho Chi Minh City has undergone many changes over the period 1975 - 1985 and from 1986 to present. From 1976 to 1985, the city focused on economic recovery after the war, and there were no major constructions. By 1985, the Central Committee identified Ho Chi Minh City as a major economic center, an international trading and tourism center of the country. This city has an important position and that is one reason why the majority of migrants from the other areas; some return to their families or were assigned to work in the city. The period from 1986 up to now, the city entered the renovation period, the influx of immigrants into the city during this period from the Mekong Delta and the Central Coast to live and work.

The Urban Drainage Authority of Ho Chi Minh City reported there were more than 100 serious flooded locations after a heavy rainfall in 2004. By the end of 2017, in Ho Chi Minh City, there were about 220 flooding points, mainly due to rain or rain combined with high tide, of which 171 were flooded in roads or alleys managed by the district (small flooded areas) and 49 flooding points on major roads or areas managed by the Ho Chi Minh City Flood Control Centre. This situation comes from both objective and subjective causes [3].
The first step out of the socio-economic crisis, the first step out of economic recovery, the pressure on immigrants into the city is even stronger.

![Sky-scrappers in Ho Chi Minh City](image1.jpg)

**Figure 2.** Sky-scrappers in Ho Chi Minh City

Especially for developing economy, big cities like Ho Chi Minh City is given priority in transport and infrastructure development projects such as international airports and metro. Along with the more vibrant urbanization process, the increase in population has made the land fund increasingly narrower, putting great pressure on the demand for housing in urban areas (Figure 2).

![The sudden increase in population of Ho Chi Minh City](image2.jpg)

**Figure 3.** The sudden increase in population of Ho Chi Minh City

The more people live near Ho Chi Minh City, the more they have the opportunity to enjoy amenities and utilities at a good cost and with a high quality of life. Other health, transport, and some aspects of social capital may also increase with urban compression. And the more the city grows in size, the greater the concentration of labor and employment increases, the greater the benefits of convergence for both businesses and urbanization economies (Figure 3). As the population grows, so do the inevitable social problems that come with it [3].

### 2.3 The consequences of urbanization

#### 2.3.1 Poor air quality
Air quality is declining, urban green space is shrinking, noise pollution, garbage pollution, and even toxic air pollution from urban factories is the best evidence for the quality of air. The amount of environment is declining, but the root cause is the management and planning issues [4]. Indeed, in Vietnam's major cities, typically Ho Chi Minh City, traffic pollution accounts for about 70% of the city's total emissions, the concentration of emissions in roads and densely populated areas. Resident exceeds the permitted level many times. According to the latest statistics, Ho Chi Minh City now has more than 9 million motorbikes, and 500 thousand cars of all kinds. Transport vehicles using diesel, gasoline fuel or fossil origin have discharged large a lot of NO, CO2, SO2 gas (Figure 4).

![Figure 4. Vehicle exhaust in Ho Chi Minh City](image)

Since 2003, the number of motor vehicles in circulation has tripled. The improvement in the living standards of households and the emergence of a new middle class has caused the number of cars to skyrocket. Besides, the number of motorcycles is also constantly increasing. Therefore, road accidents, traffic congestion and environmental pollution are becoming more and more serious. A major challenge is that the government must encourage people to use public transport. To do so, we must diversify in terms of facilities, attractive in price and safety in traffic. However, at present, the public transportation system including 100 bus routes has only met 7% of the city's travel needs [5]. The government set a goal that by 2030, public transportation must account for 60%, deploying 8 high-speed subway lines and 6 high-speed bus routes. The first high-speed subway line, largely invested by the Japan International Cooperation Agency, is under construction using Japanese technology and is expected to be operational by 2020. The World Bank has also agreed to lend capital to build the first high-speed bus route. And the German Cooperation, the Asian Development Bank and the European Investment Bank, co-sponsor the construction of the second high-speed bus.

2.3.2 Power consumption

Compared to small towns, the higher the level of urbanization is, the higher the energy consumption is. In recent days, due to hot weather, the amount of electricity consumed in Ho Chi Minh City reached a new record. Specifically, the amount of electricity consumed in Ho Chi Minh City reached 90,038 million kWh, 10% higher than the peak of 2018. The power consumption on this summer (April of 2019) was 2.5 times higher than the lowest day since the beginning of 2019 (35.5 million kWh). Therefore, Ho Chi Minh City Power Corporation calls on customers, businesses, offices and all citizens to pay attention raise awareness of safe, economical and efficient use of electricity [6].

2.3.3 Waste problem

According to the Ministry of Natural Resources and Environment, the field of plastic waste recycling in Vietnam has not been developed. The rate of waste sorting at the source is very low; most types of waste are put together and collected by waste trucks. In addition, the plastic recycling technology used in Vietnam's major cities is outdated, low in efficiency, high in cost and polluting the environment. In
addition, the recycling of plastic waste has not been organized on a large scale, mainly by small businesses so the efficiency is low.

![Figure 5. Waste in Ho Chi Minh City](image)

Meanwhile, the habit of people using plastic bags and plastic disposable items is increasing. It is worrying that people still do not have the habit of classifying daily waste, mixing plastic waste, especially nylon is relatively common (figure 5). This makes the plastic waste handling more difficult, leading to the increasing plastic waste in big cities in this country [7].

2.3.4 Impacts from climate change
And yet, the current urban areas are facing the threat of climate change increasingly serious and unpredictable. With the massive development, lack of vision planning, only attention to immediate benefits, the consequences of urban areas that are firstly coastal cities suffer greatly [8].

![Figure 6. Flooding in Ho Chi Minh City](image)

Flooding in Ho Chi Minh City has been happening for a long time and is considered as a "chronic" disease. However, in the past 20 years, flooding has become more and more serious and complicated, adversely affecting the lives of millions of people (figure 6).

2.3.5 Other urban issues
In addition, graphical issues are also one of the consequences of urbanization in the past decade. Increasing labor is associated with population growth, from agriculture to non-agriculture faster and faster, leading to management gaps. The free migration rate makes it difficult to control the population. Many regions have negative population status, that is, no longer working age population, which means the pressure on urban areas is enormous. For example, in Ho Chi Minh City, the population increases
each year with the population of one district while the urban area cannot increase. This leads to
problems, social security, and employment are also not guaranteed [9].

3. Things to do in order to improve the quality of life
The high population density makes it cheaper to provide public services such as electricity, water,
sewage treatment, and transport to urban residents in rural areas. The city is also home to many
services industries, which do not need natural resources, and are not polluting to the extent that
manufacturing industries are slowly moving away from the city.
It should be recalled that although urbanization benefits businesses and workers living and working in
urban areas, urbanization also incurs inconveniences and costs. The above-mentioned inconveniences
and costs are due to traffic jams and externalities of economic activities. Because it is home to a large
number of businesses and workers, the city is also home to a range of resources including financial,
physical, and energy for economic activities and human life. And the city also generates a huge
amount of material in the form of the production process and the waste generated by the residents'
production and living activities. The higher the level of urbanization, the stronger the economic
activity, the greater the amount of resources consumed, and the greater the amount of material created.
Population growth and economic development will put enormous pressure on the amount of material
and resources absorbed by the cities as well as the amount of materials they produce. This pressure
affects the city's administration and urban management, forcing them to become more active in
seeking policies that effectively influence the processes involved. For example, local governments
must have strict laws that Singapore is applying. There must be a punishable penalty range from mild
to severe, which may include fines, imprisonment or other strong measures.
Waste treatment issues need to be researched to suit the economic conditions. Waste disposal by
landfill or by rudimentary techniques will not be suitable for a megacity like Ho Chi Minh City.
Japanese technology may also need to be considered in order to reduce waste. At the same time,
educating people, especially children, about the use of plastic bags is a must. Education programs on
the use, classification and limitation of plastic waste are what we should do from the lowest education
levels to the university level. We should create a habit for the whole people to follow.
Besides, we need to plan on land in urban and rural areas appropriately to avoid migration. If
production facilities are reasonably arranged, skyscrapers are not so many in urban areas and if the
city's economic activities do not negatively affect the environment and natural ecosystems in an area,
the quality of life will be surely better. Covering more green spaces, planting more trees will improve
the amount of oxygen. We can launch home-grown houses and people who protect nature by planting
trees around the house.
Especially, in the hot period, it is necessary to pay attention and formulate habits such as not setting
the air-conditioner temperature too low, preferably above 25 degrees. People should use electricity
economically and efficiently, at the right time, in the right place, in the right way, according to
requirements and refer to the instructions on economical use of electricity. That people should not use
energy-consuming devices such as electric stoves, irons, water pumps during peak hours is also a good
piece if advice. In addition, manufacturing enterprises need to balance production schedules in the
direction of reducing electricity usage during peak hours, increasing electricity use during off-peak
hours, investing in energy-efficient production equipment and coordinate with the electricity industry
to monitor and control the quality of electricity.

4. Conclusion
In short, urban management in general and urban environment management in particular are
increasingly difficult, the current state of environmental pollution, especially in large cities, has not
been improved. The economy is getting worse due to the pressure of population growth and the
development of road transport, which requires all levels and sectors in the future to have
comprehensive solutions from management to technology to control and reduce pollution in urban
areas, and at the same time mobilizing resources and people to protect the environment for sustainable
urban green development.
5. References

[1] Storch, H. and Downes, N.K 2011 A scenario-based approach to assess Ho Chi Minh City’s urban development strategies against the impact of climate change. Cities. 28 517-526

[2] Uttara, S., Bhuvandas, N. and Aggarwal, V 2012 Impacts of urbanization on environment. International Journal of Research in Engineering and Applied Sciences. 2 1637-1645

[3] Le Vo, P 2007 Urbanization and water management in Ho Chi Minh City, Vietnam-issues, challenges and perspectives. GeoJournal. 70 75-89

[4] Uttara, S., Bhuvandas, N. and Aggarwal, V., 2012 Impacts of urbanization on environment. International Journal of Research in Engineering and Applied Sciences. 2 1637-1645

[5] Zhang, C., Tian, H., Chen, G., Chappelka, A., Xu, X., Ren, W., Hui, D., Liu, M., Lu, C., Pan, S. and Lockaby, G 2012 Impacts of urbanization on carbon balance in terrestrial ecosystems of the Southern United States. Environmental Pollution. 164 89-101

[6] Franco, S., Mandla, V.R. and Rao, K.R.M 2017 Urbanization, energy consumption and emissions in the Indian context A review. Renewable and Sustainable Energy Reviews. 71 898-907

[7] Danh, N.T. and Hoi, H.T., 2019 Effects of plastic waste to sea environment in Vietnam. In IOP Conference Series: Earth and Environmental Science. 351 012023

[8] Pertiwi, I.G.A.I.M., Winaya, N.A.P., Andayani, K.W. and Kristinayanti, W.S 2019 Waste management system on Badung River area in Bali. In IOP Conference Series: Earth and Environmental Science. 351 012005

[9] Younger, M., Morrow-Almeida, H.R., Vindigni, S.M. and Dannenberg, A.L 2008 The built environment, climate change, and health: opportunities for co-benefits. American journal of preventive medicine. 35 517-526

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