TOWARD AN ENVIRONMENTALLY SUSTAINABLE CITY IN THE LIGHT OF INDUSTRIAL REVOLUTION 4.0: A CASE STUDY OF HO CHI MINH CITY

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I. INTRODUCTION

Like other large cities in ASEAN, Vietnamese cities have been facing serious urban environment problems such as air pollution, land degradation, weak water drainage and lack of green spaces. These problems are caused by unsustainable patterns of development. City governments have failed to coordinate and integrate city planning consistently. Trends show that governments prefer to take short-term economic profit rather than focus on environmental protection.

While it is often stated that the processes of economic liberalization and international market integration reform go along with more efficient resource use (including the use of environmental resources), there is quite little empirical evidence to suggest that industrialization leads to positive impacts on the environment or a stronger emphasis on environmental protection and sustainability in policymaking. The protection of the environment and the sustainable use of resources has regularly taken a backseat in the urbanization process that is ongoing in most cities of Vietnam. The impact of environmental degradation in urban areas is huge and widespread. It has significant impact on human health, as well as causing financial loss and visible reduction of the quality of life. Air pollution has contributed to respiratory disease. The release of toxic substances into water contributes to birth defects and loss of species and ecosystems. Thus, there is an urgent need to establish environmentally sustainable urban development plans for cities in Vietnam.

With the expansion of Industrial Revolution 4.0, the Ho Chi Minh City (HCMC) government has adopted a new urbanization development strategy for the period 2020 to 2030, which aims to develop "smart cities within the city" to achieve a balance between modernization and environmental protection. It is expected that developing smart cities will support HCMC to solve existing problems in transport infrastructure, healthcare, education, energy, and inadequacies in urban management and planning, but it will also activate new growth engines for the country.

This paper will examine the implementation of the new urbanization strategy by the HCMC government to build an environmentally sustainable city and its challenges.

II. CONCEPTS OF ENVIRONMENTALLY SUSTAINABLE CITIES

In the past several decades sustainable development has been widely recognized as the goal to be achieved in many countries in the world. The concept of sustainable development become popular when the World Commission on Environment and Development chaired

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by Gro Harlem Brundtland, the then-Prime Minister of Norway, published the report "Our Common Future". The Brundtland report defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[1] Urban sustainable development therefore can be seen as improving the quality of life in a city, including its ecological, cultural, political, institutional, social and economic components, without leaving a burden on future generations.

Ecological sustainability means development that is based on a long-term perspective. It is essential to conserve the productivity of the waters, the soil and the ecosystem, and to reduce our impact on the natural environment and people's health to a level that the natural environment and humanity can handle.

Queensland's Integrated Planning Act 1997 states that Ecological Sustainability is defined as a balance that integrates: (i) protection of ecological processes and natural systems at the local, regional, State and wider levels; (ii) economic development; and (iii) maintenance of cultural, economic, physical and social well-being of people and communities. As a matter of fact, each of these concepts is further defined in terms of conservation, enhancement, intergenerational equity of economic and ecological processes and biological diversity.

ASEAN leaders while promoting the Blueprint for the ASEAN Socio-Cultural Community have built the framework for environmentally sustainable cities in ASEAN, which focuses on achieving a quality of living environment in any city – Clean Air, Clean Water and Clean Land.[2] I will use the definition from the ASEAN Working Group on Environmentally Sustainable Cities in ASEAN for achieving quality of urban life – Clean Air, Clean Water and Clean Land – as an indicator in judging whether or not Ho Chi Minh City has implemented an environmentally sustainable city.

III. The Underlying Causes of Urban Environmental Degradation in Vietnam

According to Carter Brandon and Ramesh Ramankutty, there are four underlying causes of environmental degradation in Asia and most parts of the world, namely: (i) fundamental market and policy failures concerning the management of natural resources and environment; (ii) the population problem and poverty; (iii) overly quick urbanization and industrialization; and (iv) the misconception that there is a trade-off between environmental protection and economic growth.[3]

Based on my observations, there are very clear reasons for the environmental degradation in the large cities in Vietnam, especially Ho Chi Minh City – the most populous urban area of the country (over nine million inhabitants).[4] First, since the Doi Moi era, HCMC has quickly become the most important economic engine of the Vietnamese economy (contributing nearly 24% to Vietnam's GDP). As an economic

[1] World Commission on Environment and Development, *Our Common Future* (Oxford University Press 1987).
[2] ASEAN, *ASEAN Cooperation on Environmental at a Glance*, available at https://asean.org/wp-content/uploads/2018/02/50.-December-2017-ASEAN-Cooperation-on-Environment-At-A-Glance.pdf (last accessed 10 July 2021).
[3] Carter Brandon and Ramesh Ramankutty, *Toward an Environmental Strategy for Asia* (World Bank Discussion Papers; Washington DC, 1993).
[4] World Population Review, 2020.

engine the city is at the top in terms of economic development, surpassing the normal development of other locales. This also means that the city helps the economies of surrounding areas develop. To that end, the thinking that creating valuable benefits is more important than protecting non-economic value has been promoted in the city government. Second, the government does not adequately enforce the law in certain industries because they are captured by the very industries they are supposedly regulating. In other words, the government authorities emphasize their roles in developing the industry and ensuring the well-being of the industry rather than maintaining compliance with statutory obligations. Third, there are institutional weaknesses in the local environment agency. The district environmental agencies lack capacity to do pollution monitoring and control; they also lack technical and administrative capacity in environmental management.

The Vietnamese government, meanwhile, has always considered quick urbanization as the main criterion for industrialization and modernization. This issue has been mentioned repeatedly in the Resolutions of National Congress during the past decades. The then-Prime Minister, Nguyen Xuan Phuc, in an early 2017 talk suggested that urbanization was an unavoidable feature of social and economic development. The official acknowledgement of the role of urbanization suggests the State's determination to accelerate urbanization.

The emphasis on rapid urbanization in Vietnam is based on two arguments. First, Vietnam's urbanization rate is behind that of other countries in the region. As a result, the process of urbanization should be accelerated in order to catch up with industrialization. Second, developed countries have a higher urbanization rate; therefore, for Vietnam to continue to grow and improve its economic structure, a higher urbanization rate is necessary. Starting in 2010, a number of programs for institutional reform in selected towns were established to experiment with policies that would help facilitate urbanization. It can be observed that most of the previous research and planning on urbanization in Vietnam has mainly focused on whether urbanization should be accelerated and whether urbanization should include towns or be focused only on large cities. Meanwhile, little attention has been paid to the issues of protection of environment and the sustainable use of resources in the process of urbanization, while the impact of environmental degradation in urban areas is huge and widespread.

Fast urbanization without proper planning has, however, created significant impact on human health, financial loss and visible reduction of the quality of life. Air pollution has contributed to respiratory disease; the release of toxic substances into water contributes to birth defects and loss of species and ecosystems. HCMC has been facing serious problems of air pollution, water pollution and land and soil pollution. It is observed that the city government has failed to implement environmentally sustainable development for years.

The environmental problems in HCMC can be described as follows:

A. **Lack of green spaces:** There is an imbalance in land allocation between green spaces/areas or parklands and buildings. The government has been criticized for approving licenses to build malls and supermarkets easily for investors without properly assessing their impact on the environment. Parks, playgrounds and green spaces/areas have been seen as common property which have no economic benefit or revenue to the city.

B. **Air pollution:** The major contributor to air pollution in HCMC is transportation and industrial activity. The development of industrial parks and the increasing number of cars and motorcycles contribute significantly to the increase in atmospheric air pollution in HCMC. Based on the assessment of IQ-Air, the air quality index of HCMC is very poor. The PM2.5 concentration in HCMC air is currently 3.6 times above the WHO's permitted value.[5] The air pollution in HCMC is higher than in London or New York.

C. **Water pollution:** HCMC faces serious problems of water pollution. Saigon River and Dong Nai River, the main water supply sources to the city, are heavily polluted by industrial effluents and domestic waste. A study conducted by a local NGO found that 80% of the river's pollution was caused by industry, particularly pulp and paper, monosodium glutamate, dyeing, sugar and tile, coconut oil and metal fabrication plants. Many small- and medium-scale industries do not install pollution abatement equipment or technology.

D. **Land pollution:** Land pollution in HCMC is primarily caused by two major sources: domestic waste and industrial waste. A recent survey conducted by the local government on land quality in HCMC found that more than 20% of land does not meet abatement measures. As we know, toxic waste creates the potential for serious health and environmental problems. However, HCMC does not have adequate disposal facilities for municipal garbage.

IV. Developing "Cities Within a City" – A Solution for the Urbanization Problem

Facing with increasing challenges from urbanization, the HCMC People's Committee (with the support of the Government) has developed a new strategy of urbanization. Under the new strategy, instead of trying to make a single, large city into an omnibus center for a region, HCMC is now developing the city network concept, which relies on the clustering of many settlements, each with its own specializations and localized hinterland relationships.

The HCMC government is forging ahead with smart-city development initiatives by harnessing data and technology to create efficiencies, improve sustainability and enhance the quality of life for the people living and working in the city. The smart city consists of three strategic outcomes or objectives: competitive economy, sustainable environment and high quality of life.

The development of a smart city in HCMC comprises the following:

A. Employing digital technology to solve existing problems in transport infrastructure, healthcare, education, energy, and inadequacies in urban management and planning.

B. Improving the public utility services, by implementing the Internet of Things to ensure more efficient and better-quality water and energy supply for residents in the smart city.

[5] https://www.iqair.com/vietnam/ho-chi-minh-city (last accessed 10 July 2021).

C. Improving public security, by implementing surveillance cameras within the city that come with the capability to recognize faces together with AI.
D. Developing necessary databases for E-government, including the city's digital one-stop for complaints and accusations, hotlines, business registrations, foreign investments, taxpayers, foreign laborers in HCMC (which are integrated into one common database) to improve administration.

The HCMC People's Committee has started implementing a pilot project for developing the concept of a "city in the city" in the new municipality of Thu Duc, which was recently formed from two districts (district 2 and 9) of HCMC under Resolution 1111/NQ-UBTVQH of the NA Standing Committee (9 December 2020).

Thu Duc City is expected to be the core of development in HCMC. The government aims to promote Thu Duc City to become a Vietnamese Silicon Valley. The foundation of this plan is that Thu Duc City will be home to several big industrial parks, the Vietnam National University and some other technical universities, and especially as the base of the biggest High-Tech Park and Cai Lai Port. The universities will play a training role, providing qualified human resource to hi-tech zones. The master planning of Thu Duc City also addresses the environmental values based on IT solutions.

It is believed that these recent policy reforms on city development may foster sustainability and the economic growth and trade of HCMC. The urbanization plan is being carried out with the purpose and vision of the city in the year 2030 having a high standard of public health, with clean air, land, water and a quiet living environment. The municipality intends to apply high environmental standards to ensure that the organizations operating within Thu Duc city continuously improve their environmental performance.

However, there are also various challenges to smart city initiatives. One of the main challenges which is frequently cited is the affordability of solutions and data integration to meet citizens' demands and to generate returns on investment. When investing in new technology and digital infrastructure, sometimes the pay-off may not be clear. In addition, the ability to control and manage new technology to serve the purpose of development is also a big concern for society. Some NGOs have criticized the development of surveillance camera systems as a threat to personal freedom.

V. CONCLUSION

The implementation of environmentally sustainable cities in Vietnam will be very hard to achieve if the current trend of unsustainable development of cities continues. There is an urgent need to improve environmental performance in many cities in Vietnam. HCMC as the biggest economic center of the country has been facing a serious problem of urban environmental degradation. There are many challenges to the implementation of environmentally sustainable cities. However, the new city development strategy of HCMC may help to promote a new concept for urbanization in Vietnam. The development of new smart cities can serve to activate new growth engines as well as address various environmental issues and problems.