An insight on Surabaya development: pre colonials, colonial, post colonial and current era

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Abstract. Surabaya is the second biggest metropolitan of Indonesia. Its rapid development has established from the northern part to the south. The city has transformed from an emerging industrial city into business and trading city. However, the city is also facing escalating risks and challenges. Therefore, a pressure of development becomes intense which requiring a more careful approach to achieve a desired future sustainable Surabaya. In responding to that, special concerns about making Surabaya more resilience especially to disasters, creating an effective waterfront development management for the city and designing Surabaya as a compact city are keys to a better Surabaya in the future.

Keywords: Surabaya, urban history, urban development, urban sustainability.

1. Introduction
With a population of 2.9 million [1], Surabaya, also known as the “City of Heroes” in Indonesia, is the second largest city in the country after Jakarta. It is located on northeastern of Java island, facing the Madura Strait (Figure 1). Surabaya serves as the capital city of East Java Province and administratively, it is divided into 31 districts (Figure 2).
As a metropolitan city that keeps growing and improving through years, Surabaya has played a significant role as a social and economic hub for not only the area in its surrounding but also for Indonesia and some other countries in the region. With the increased activities along with the rising number of its population, the city government has seriously attempted to accommodate and facilitate the activities of its residents and at the same time to keep the quality of its ecological system, in order to create a sustainable urban environment. Although the attempts have got some recognition both at national level, for instance by receiving the Indonesian highest environmental award for cities since 2006, known as the Adipura Kencana, and also at international level such as the ASEAN Environmentally Sustainable City Award in 2012, the city is still facing some challenges and striving with many development issues.
Despite its important role and achievements, the study of Surabaya city is still received little attention, especially for a wider international audience. In this article, the discussion about development in Surabaya will be elaborated in a chronological order, from an ancient settlement to a metropolitan city with a high demand for built areas to accommodate its fast economic growth.

2. The Origin of Surabaya
The earliest record of the name Surabaya can be found on the Trowulan epigraph from 1358 A.D. in which it was spelt as Churabhaya in old Javanese script (Widodo, 2010). However, according to G. H. von Faber—a German-Dutch journalist who was born in Surabaya and the founder of the Mpu Tantular Museum in Surabaya—the city may have already existed a century earlier as a settlement area for the soldiers of Kertanegara, the last king of Singosari Kingdom [2]. With regard to the name of Surabaya, the locals believe that it derives from two words: sura and baya (respectively means shark and crocodile in Javanese). According to the local myth, those two animals had a fierce battle in the area and they both have been taken as the icons of the city (Figure 3). Based on the official website of the Surabaya Municipality, the myth might be based on the big battle between the army of the Mongolian Kingdom who came from the sea (represented as the white shark) and the Majapahit Kingdom that occupy the land (represented as the giant crocodile). Some historians who were appointed by the Surabaya municipality in 1973 had estimated that on 31 Mei 1293, the Majapahit army succeeded in defeating the Mongols in the battle that took place in the area. This date has since then set by the Surabaya government as the anniversary of the city.

Figure 3. Sura (shark) and baya (crocodile) as the icon of Surabaya
Source: allindonesiantourism.com

Although historical evidence about the initial development of Surabaya can rarely be found, there is some evidence to support that in the 16th Century Surabaya was already developed as a major trading port under the government of Kadipaten Surabaya which first was part of the Majapahit Kingdom and later on the Demak Sultanate before it was captured by the Sultanate of Mataram [3], [4]. The city once served as the main gate to enter the Java inner-land in the east from the ocean through the Kalimas River. Due to its strategic location on the busy trading route between Malacca

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1 Official website of Surabaya Municipal Government
Strait and Maluku islands (known before as the Spices island), Surabaya has emerged as a leading coastal power in the region [4]. As a port city, Surabaya has also been characterized as a multi-cultural city with a mixture of people from various origins since at the early stage of its development [2].

3. The Colonial Era

In 1625, Surabaya was fallen under the control of the Dutch colony through the VOC (the Dutch East India Company) that also dominate most of the area that now parts of Indonesia but back then is called as the Netherlands East-Indies [4]. Later on, the Dutch developed Surabaya not only as the centre of the distribution and trading activities for the products of Java’s plantations through the port of Kalimas river (Figure 4) but also as their largest naval base in the colony [5]. During this era, Surabaya has already shown the potential to be a metropolitan city which is dominated by trading and service-based activities. The transformation of Surabaya as a future metropolitan city could also be related to two important things that lead this city to become an industrial city with the establishment of the steel industry and the expansion of rural areas as export commodities producers [2]. The establishment of the steel industry is then followed by the development of other industries, such as construction workshop, wood-cutting industry and traditional wine distillation industry [2]. At this stage, Surabaya has grown not only as a trading city but also an industrial city.

With those developments, many European have soon afterwards expanded their colony in Surabaya along with the locals and also other ethnics who already came to the area and stayed there to build their business. The VOC grouped the most prominent ethnics in the area into four separate settlements, which included the Dutch and other Europeans, the Arabs, Chinese, and the local Malay or Javanese (see Figure 5). These different settlements have become one of the main features of the city at that time which somehow still can be recognised until now.
After the dissolution of VOC due to bankruptcy at the end of the 18th century, the control over the Netherlands East-Indies, including Surabaya, was transferred to the Dutch Colonial government. On April 1st, 1906, the Dutch Colonial Government granted Surabaya the status of the municipality [6]. However, only after ten years later the first mayor, A. Meijroos, was appointed to the city. Under the Dutch Colonial, Surabaya was designed as a typical European city (see Figure 6). One of the most influential architects of the city was Cosman Citroen who came to Surabaya in 1915 and later on was appointed as a municipal architect [7].
In order to cope with the growing numbers of populations and activities of the city, many infrastructures were developed which transformed it to become a modern city. One of the important infrastructures was the Tanjung Perak harbour in the estuary of Kalimas river which construction began in 1910 in order to facilitate the increase of trading and cargo traffic (see Figure 7) that could not be accommodated anymore by the port of Kalimas river. The plan to built a bigger port for Surabaya was actually already started in 1875 but the development was postponed due to a shortage of funds [8].

In addition to the new harbour, the city was also equipped with a modern transportation system, for instance, the steam-tram line which was operated by the OJS (Oost Java Stoomtram) Company. In 1924, the electric tramway system in Surabaya was completed (see Figure 8) that connected Tanjung Perak in the north and Wonokromo in the south via Darmo Boulevard and Willemskade, and also the Bagong and Gubeng area in the east side of the city and the Sawahan area in the west² [9]. Along with the development of new infrastructures, new and modern facilities such as hospitals, post office, banks, and high schools also developed in the city (see Figure 9) as well as the networks for electricity and piped water supply.

² The tram lines in Surabaya were destroyed during the Indonesian National Revolution (see section 4) and the services are discontinued ever since.
Figure 7. The Port of Tanjung Perak in the 1920s

Source: Collection of Koninklijke Marine

Figure 8. Electric tram in Willemskade (now Jembatan Merah street), Surabaya in the 1920s

Source: Leiden University Library, Colonial Collection (KITLV)
Figure 9. Some early modern facilities in Surabaya that were built in the 1920s: (clockwise from left-top) Simpang hospital, post office, high school (HBS), and bank. Source: Leiden University Library, Colonial Collection (KITLV)

4. The Post-colonial Era until the End of 20th Century

During the World War II, Japan dismantled the hegemony of Dutch East-Indies colonial government. Following the surrender of Japan to the allied forces, Soekarno and Mohammad Hatta declared the independence of Indonesia on August 17th,1945. Soon afterwards, the Dutch tried to re-establish their colony with (in the beginning) the help of the British who got a mandate to be the caretaker of the Dutch colony after the surrender of the Japanese. The Indonesian fought fiercely for their independence and start the Indonesian National Revolution. One of the well-known battles of the Indonesian revolution is the Battle of Surabaya which reached its peak on November 10th 1945. The date is later commemorated by the Indonesian as the Heroes Day and Surabaya has since been also called as the City of Heroes by the Indonesians.

After the Dutch eventually recognise the sovereignty of Indonesia at the end of 1949, many cities, including Surabaya, were still facing hard times especially to rise from the devastations caused by the war. Most of the population suffers from poverty and many of them were homeless because their houses were destroyed or taken over by others during the evacuation [10]. At the same time, the number of people who came to the city from the surrounding areas seeking for a better life was also increased since many plantations and the related industries in rural areas have stopped with their operations [11].

The limited available space for settlements and the high demand for new housings due to the rapid growth of population—especially a group of a low income—has led to uncontrolled settlement developments in Surabaya City [11]. As notified by Silas, the settlements of people with low income who come to a city, particularly Surabaya, are mostly concentrated in urban kampung and fringe villages [12]. Silas also added that in Surabaya, kampungs are commonly developed from rural villages that have been included as a part of an urban area due to the urban sprawls; or from empty or abandoned lands in the city that were occupied and claimed by the incoming migrants, mostly in the post-war period. Although in general kampungs are mostly inhabited by low-income communities and they have a minimum quality of urban facilities and services, they are not always the same as the slum
area [13]. Moreover, since many informal enterprises are based there and their existence has provided many city workers with a place to live, kampungs have become an essential element of the city [12]. Therefore, in order to improve the productivity, sustainability, and the liveability of the city, it is important to improve the condition of urban kampungs.

As a matter of fact, the program to improve the condition of kampung in Indonesia has been introduced in the 1920s by the Dutch colonial government [14]. After the independence, the Indonesian government also recognized the importance of such program and launched the nation-wide Kampung Improvement Program (KIP) in 1969 in Jakarta and Surabaya with the World Bank funding [12]. Although in the beginning KIP only focused on physical upgrading, it arguably has successfully reduced urban poverty (Silas, 1992).

Along with the launch of the KIP, during this era, Surabaya also experienced a new massive wave of real estate developments by private sectors, especially for high- and middle-income communities. This phenomenon is triggered by the increasing demand for new good quality residential areas as a result of the growing economy of the city. The developments of the new real estates in Surabaya mostly extend to the west part of the city because there were still many vacant lands available in this area. One of the most prominent real estate development projects in the area is the CitraLand which construction began in 1993 and occupied an area of 2,000 ha [15].

In addition to the new developments of the residential area as described above, this era also marked by large-scale infrastructure developments in Surabaya. For instance, in 1959, the national government started the development of the new airport, called the Juanda Airport, which was the first airport development project in the country since its independence [16]. The development was finished in 1964 and at first, this airport was mainly used for the naval air base to replace the older one in Morokrembangan. However, over the course of time, the airport also used for civil aviation due to the increased demand for it. The first international flight was opened at the airport in 1987 (see figure 10).

![Figure 10. Juanda Airport](Link to figure)

Source: Wikimedia Commons/ Fatur Almakawi

Six years after the opening of Juanda Airport, the substantial redevelopment and expansion project was also started for the Seaport of Tanjung Perak (Figure 11). Later in 1991, the port of Tanjung Perak launched a new facility, the international container terminal (Terminal Petikemas Surabaya), with the capacity of two million TEUs/year [2]. With this development, the port has not only contributed significantly to the economic development by accommodating the trade traffics for the city and the province but also the eastern part of Indonesia.
With regard to the economic development activities, Surabaya was mostly dominated by manufacturing industries during this era. This mainly was supported by the government policy, both at the national and local level, to adopt the idea of industrialization as one of the main strategies in the regional development. In Surabaya, this strategy is implemented through, among others, the development of two industrial areas in Surabaya in the 1970s: Industrial area Ngagel, which actually already exists since the colonial era, in the centre of Surabaya and the Surabaya Industrial Estate Rungkut (SIER) in the south-east part of the city. In addition to those areas, some industrial and warehousing activities also growing in the northern part of the city, for instance in the Tambak Langon – Kalianak – Margamulyo area, which is close to the Port of Tanjung Perak.

5. The Millennial Era
By the end of the 20th Century, Indonesia was hit by economic and political crises that eventually lead to a substantial reform in the country’s governance systems. One of the important reforms that has a direct implication to the urban development mechanism is the introduction of the decentralization policies—which came into effect in 2001—that gives the local governments a greater autonomy than before the reform and also the possibility to have direct election for the head of the local government [17]. Although there have been some academic research that explains the negative impact of the decentralization policies to urban and regional development in Indonesia [18], [19], the policies have, evidently, also gave opportunities to some cities to exercise some urban policy innovations that show success stories of urban development [20].

Particularly in Surabaya, one of the success stories of the urban policy innovation is related to the implementation of a waste management program in which the city government develop an international joint-venture cooperation to established several community-based composting centers and successfully encourage community participation in the 3R (reduce, reuse, recycle) campaign (Premakumara et al., 2011). This policy has decreased the total daily municipal waste generation up to almost 25% in only three years [20]. Although this success can be attributed to the exemplary leadership of the current mayor of Surabaya city, it can also be cast as positive changes that stem from electing the right local government leader which made possible by the decentralization policy.

With regard to its economic activities, Surabaya’s development in the millenial era was marked by the significant growth of some sectors other than manufacturing industry although the industry is still quite dominant in the city. As shown in Figure 12, since 2003, the commercial sector has been the most dominant sector in Surabaya. In addition, the HORECA and construction sectors also have a significant increase in the last 10 years. This situation can be related to the effort of the municipal government to transform its economy to service and commerce activities. To do so, the municipality, for instance, promoted a slogan of “Sparkling Surabaya” in 2006 as a part of its marketing strategies in
attracting tourists and business corporations to come and invest in the city (Purwanti & Genoveva, 2017). As a result, the city has successfully doubled its revenues from tourism activities and in a 2010 national business survey, the city was ranked second among the twenty largest local government economies in Indonesia on a business satisfaction index\(^3\).

![Gross Regional Domestic Products of seven main sectors in Surabaya, 2000 – 2016](image)

**Figure 12.** Gross Regional Domestic Products of seven main sectors in Surabaya, 2000 – 2016 (in million Rp.)

*Source: Surabaya City Statistical Agency*

The millennial era of Surabaya is also marked by its significant population growth (see Figure 13). Since 2000, the populations that migrate to Surabaya reached its highest number, which is 115,594 persons, in 2012. In 2015, the number of citizens that resides in Surabaya has reached more than 3 million.

As an impact of the rapid growth, the land use in Surabaya has also changed, especially to accommodate the demand for settlement area. Based on the land cover analysis, the land coverage for settlement area has reached 16,803.90 Ha in 2015. Compared to the condition in 2001, the demand for settlement area has increased by 4,551.6 Ha, which means that each year 325.44 Ha are converted to settlement area. Meanwhile, the green space has decreased by more than 1,000 Ha for the past 14 years.

The most significant changed areas could be found in the western and eastern part of Surabaya, which is dominantly converted from open space to residential area since 2001. Figure 14 illustrates the comparison of built-up areas in Surabaya between 2001 and 2015. The yellow surface indicates the build-up areas consisting of residential, commercial and industrial areas while the green colour indicates green open space consisting of bare land, parks, paddy fields and farmland. The other dominant land cover is the blue open space that consists of aquaculture, river and pond.

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\(^3\) A profile of Surabaya in the Singapore Straits Times in mid-2010 glossed Surabaya’s transformation “From shabby town to sparkling city.” The Straits Times, 14 August 2010, D7. Surabaya’s strong showing on a “satisfaction index” for business performance appeared in SWA Magazine (12–22 August 2010).
The modern days of Surabaya as a metropolitan city require more spaces to accommodate the complex activities. However, limited space is an issue due to land prices, vacant land availability and land ownership. Thus, the city also grows vertically which can be seen from the increasing number of high-rise buildings. In the near future, the number of a high-rise building is believed to increase significantly. The number application for the building construction certificate has indicated those significant increases. As indicated in Figure 15, there is a high jump number of the legalized building from 2012 to 2015. This increasing pattern is likely to keep occurring in the future. Concerning the distribution of the high-rise buildings location, they are spread out to allover of Surabaya that gives an indication of an unclear pattern of development (Figure 16).
In order to accommodate the rapid growth of population and activities in the city, the municipality has made some plans to develop and improve several main urban infrastructures in the city since many of the existing ones are already inadequate. For instance, to ease the overcapacity of Tanjung Perak port, a new container port, called as the Teluk Lamong terminal, was constructed in 2010 in the western part of Surabaya near the border with the Gresik Municipality. The port is intended mainly to handle domestic cargo. A toll road access is also constructed to connected it with the surrounding area.
Apart from that, the municipality also attempts to improve the intra-city transportation, which currently is still dominated by private modes, mostly motorcycles and cars, by establishing a mass rapid transportation. A plan to develop a rail-based public transport has been proposed (Figure 17) which also include a plan to recreate an old tramline from the south (Joyoboyo Bus Terminal) to the north (Indrapura Road intersection).

Figure 17. Surabaya plan for public transportation
*Source: Regional Regulation No. 12 in 2014 on Surabaya Regional Plan (RTRW)*

6. Challenges for Future Surabaya Development
Indisputably, the concept of sustainability has become one of the major transformative drivers of development in many cities and it is also applied to Surabaya. There are at least three urban development approaches or models that can be adopted by Surabaya given the specific characteristics of the city. The approaches are related to the issue of urban resilience, waterfront development, and compact city. In this section, some challenges concerning to the implementation of those approaches are discussed.

6.1. Urban resilience
One of an important aspects in the effort to achieve a desired future sustainable city is the ability of the urban system—which include all of its social, economic, and ecological constituent—to maintain or rapidly return to desired functions in the face of a disturbance or shocks, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity, which also known as the urban resilience [21]. As Surabaya endures to grow and at the same time also faces uncertainties and challenges such as climate change, urban resilience has become an increasingly important concept in its urban sustainability strategy [22]. One of the pressing risks for Surabaya that can be caused by climate change is the rising of the sea level since more than 80% of Surabaya area is lowland with a height between 0 – 8m a.s.l.

Apart from the risk of sea level rise, Surabaya is also prone to the earthquake risk. In September 2017, the National Agency that responsible for recording and reporting earthquake activities in Indonesia issued a report mentioned that besides the Kendeng thrust in the further south of Surabaya which could impact the city, Surabaya is actually also bypassed by two fault lines which they called...
the Waru fault and the Surabaya fault which can be seen in Figure 18. The faults have the potential to cause an earthquake that can reach up to 6.5 magnitudes. Although based on the Agency’s historical earthquake record data, Surabaya has never been hit by a very high magnitude earthquake, there were many incidents of big earthquakes in the neighbouring area of the city in the past as shown in Figure 19. Based on that figure, the closest one was in Sidayu in 1902 and Mojokerto in 1937 with a magnitude between 6 and 7 [23]. Moreover, the latest study on earthquake microzonation in Surabaya has revealed that most of the areas in the city are prone to a moderate to high amplification of earthquake (see Figure 20).

Figure 18. Two fault lines in Surabaya area
*Source: Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG), 2017*

Figure 19. Historical earthquakes in East Java Province 1816-2016
*Source: Daryono, 2016*

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4 Press release of the Head of BMKG Geophysics Station Class II: Tretes-Pasuruan on November 9, 2017
In spite of this alarming situation, there is no significant effort at the moment to prepare Surabaya from the earthquake risk for instance in the form of regulation development that acknowledges this risk. Although there are some regulations at the national level related to the design standard for building development to reduce the potential threat of earthquake, its specific implementation rules to Surabaya is still missing. Therefore, it is highly important for the Surabaya municipal government to adopt a building code and have a system in place for building regulation at the local level that will result in adequate earthquake-resistant design and construction, more importantly for the high-rise buildings which number is growing in the city. Without this kind of regulation, many buildings in Surabaya might continue to be constructed without adequate protection, leaving people in these communities at considerable risk.

6.2. Waterfront development
As described earlier, the riverfront and waterfront areas in Surabaya have been intensely used and thriving with people and activities since the early development of the city. With the industrialisation especially during the post-colonial era, the relationship with the water was interrupted and cities begin to expand into the mainland. The development of port activities also blocked access to the water and many places next to the port activities areas are becoming less attractive and obsolete.

In many cities around the world, the (re)development of urban waterfronts has been one of the important economic developments [24]–[26]. Waterfront sites evidently offer many opportunities not only for economic development but also for public enjoyment. The municipal government of Surabaya is also aware of those potentials and tries to capitalise them by, as stated in the city’s latest spatial plan, setting up three strategic areas for the city waterfront developments, which located in the districts of Benowo, Asemrowo, and Bulak (see Figure 21). It is also mentioned in the plan that the areas in the Benowo and Asemrowo Districts will be developed to support the activities of the Port of Teluk Lamong Terminal and the area will be equipped with facilities and infrastructure that are necessary for those activities. Meanwhile, the area in the Bulak District is intended to support marine tourism activities and the development of the area. Especially for the area in the Bulak District, the municipality has tried to offer the waterfront development projects in the area to some private investors and also prepared an investment of about Rp 175 billion (or about USD 12.5 million) to build road infrastructures and parks [27]. Apart from the development of recreation facilities, the private investors might also be interested to develop some high-rise apartments and condominiums.
that optimizing the utilization of view’s orientation to the water in the area, especially for the mid and high-income group.

Figure 21. The proposed waterfront development areas in Surabaya
Source: Surabaya Spatial Plan 2014-2034

Although the development of waterfront area has always been hailed as a promising strategy, it should definitely be taken with cautions due to some complexities that involve different actors and considerations to the human and non-human environment in its processes. For instance, as argued by Bunce & Desfor [28], the connectivity of the process and contents of the development with the local people as well as the balance between the environmental benefits and the human needs are among the key factors in the waterfront development. Moreover, concerning the high-rise building that is going to be built in the area, some site-considerations should be taken into account, for instance they should not cast significant shadows on public parks, plazas, waterways, beaches or playgrounds and each building must not only be evaluated on its shape, height and orientation, but they should also focus on environmental factors, by creating better relationships and harmony between buildings and their urban and environmental contexts [29].

At the moment, the Surabaya municipal government already has some regulations that provide a guideline for the maximum building height and there is also a consideration to make a specific high-rise buildings zonation in the city. However, specific principles to improve the connectivity of the buildings with the local people and to preserve the ecosystem should also be considered as a part of the building regulations in the future.

6.3. Compact city
The significant growth of populations and their activities in Surabaya has evidently lead to an increasing demand for land. With a limited available land especially in the city centre, urban sprawl has become unavoidable. This has resulted, among others, to an increase of green/blue spaces conversion to build up areas which can cause a higher risk of future floods due to an increased runoff also costs for the provision of public infrastructure, utilities, and services, as well as the social segregation that in end would decrease the livability and sustainability of the city. In another side, the increasing demand for development land, for instance, to build high-rise buildings as happens in Surabaya, indicates that the city is still economically attractive for new investments. Regulating this development attraction could sustain the development process in Surabaya.

Creating Surabaya as a compact city could be a promising response to this situation through the reduction of land conversion and replacement of the horizontal development with vertical

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5 Kajian Penyusunan Potensi Pendapatan: Prakiraan Potensi Penerimaan PAD dari Bangunan Tinggi Kota Surabaya, 2016
development. Compact development can be rooted from several concepts such as transit-oriented development (TOD) and pedestrian-oriented development (POD). Both development concepts give a priority to the non-motorized and public transportation mode together with a mixed-use land use allocation in order to create a balance interaction among varieties of land uses with no/limited distance. The interaction between different land use types and a walking distance can also be considered as a solution particularly in making the city sustainable [30], [31].

As mentioned earlier, there is already a tendency that Surabaya will also grow vertically with the increasing number of high-rise building developments. However, those developments are spread throughout the city without a clear pattern of development which could also lead to sprawling activities. The consideration to make a zone for high-rise buildings that was mentioned earlier could initiate a way to prevent the sprawling and support the compact development in the city. The zone—which can be done in a form of node, corridor or block development—could allocate the buildings based on its height in the certain precinct of the city. With the proposed zone, the development of high-rise building can have a specific pattern that forms the spatial structure of the city.

It should be noted that, as argued by many scholars—e.g. Burton, Jenks, & Williams, [32], and Neuman [33], establishing a specific urban form alone will not be sufficient as a strategy for a sustainable urban development. A serious consideration towards the process in which how the city is functioning which include the processes of living, consuming and producing in cities as well as the understanding of the idea that a city is a process of co-creation and co-evolution would have a more imperative role to attain a sustainable city [34], [35].

7. Conclusion
Surabaya has been one of the major cities since at the beginning of the Indonesian history. The early development of the city cannot be separated from the role of port activities, first along the Kalimas river and then at the Tanjung Perak port. Although the role of the port in Surabaya development is still high, the current economic profile of the city has changed, mainly from an industrial city in the olden days to a commerce and service city in the current era.

Surabaya also has varieties of challenges from time to time with some continuing issues and also escalating to a certain level as well new issues that have not been considered before. The fast-growing population in the previous era has generated development pressure—particularly for settlement availability and infrastructures support and created a phenomenon like urban kampung in the city. This issue now is still continued and modified with the new challenges in the modern day. High demand on a high-rise building, fast rate of land conversion and a new potential of fault zone make the settlement and infrastructure issues become more complex in an urban scale.

The approach to deal with the complex issues in urban scale should be responded in a comprehensive way. Such urban development concepts and strategies like urban resilience, waterfront development, and the compact city could be considered to offer some solutions for the challenges in achieving a desired future sustainable Surabaya. The urban resilience strategy is important to improve the capacity of the city to survive, adapt, and grow given the future stresses and acute shocks from the devastating events like the rise of sea level and earthquake. The waterfront strategy that ensures the connectivity of the process and contents of the development with the local people as well as the balance between the environmental benefits and the human needs, could create many economic and social advantages for the city. While a compact development strategy could accommodate development pressure in certain areas and limited development in specially designated land such as the risky area of the fault zone, green/blue open space and infrastructures allocation land. A compact development concept with a consideration towards the process in which the city is functioning would also manage the ‘big scale’ of development including high-rise building that then shapes the urban form in a good manner and also distributes the needs of infrastructures in a more efficient way.

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