Sustainable Cities toward a Prosperous ASEAN

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Cities account for over 70 percent of the economic activities in the world today. And with most of the global population and capital goods now concentrated in urban areas, cities are becoming more important as key drivers of social and economic development than ever before.

This submission explores the challenges and opportunities brought about by the multiple facets of sustainability at the city level — economic, environmental and social — and how they contribute towards economic prosperity.
BASIC STATISTICS

3.5 billion currently living in urban areas
of world’s total population

By 2030, 5 billion
or 60% of world’s total population
expected population in urban areas

Top 750 cities account for
57% of global GDP

> 600 million people
current population of ASEAN

~ 250 million
additional people in urban centers in
ASEAN by 2025

1/3 of urban population in developing countries living in slum areas

3 percent
of Earth’s total land area occupied by cities

75 percent
of world’s total energy consumed by cities

50-60 percent
of global greenhouse gas emission attributed to cities
With a total population of more than 600 million, ASEAN is set to become one of the most dynamic regions in the world. With the rapid pace of urbanization, more people will live in cities in the future.

This expansion cities, together with the availability of better economic opportunities in urban areas will put increasing pressure on infrastructure and the provision of public services.

### Top 10 Cities in ASEAN (2015)

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manila</td>
<td>12,946.26</td>
</tr>
<tr>
<td>Jakarta</td>
<td>10,323.14</td>
</tr>
<tr>
<td>Bangkok</td>
<td>9,269.82</td>
</tr>
<tr>
<td>Ho Chi Minh</td>
<td>7,297.78</td>
</tr>
<tr>
<td>Kuala Lumpur</td>
<td>6,836.91</td>
</tr>
<tr>
<td>Singapore</td>
<td>5,618.87</td>
</tr>
<tr>
<td>Yangon</td>
<td>4,801.93</td>
</tr>
<tr>
<td>Hà Noi</td>
<td>3,629.49</td>
</tr>
<tr>
<td>Surabaya</td>
<td>2,853.24</td>
</tr>
<tr>
<td>Bandung</td>
<td>2,543.74</td>
</tr>
</tbody>
</table>

Source: World Urbanization Prospect 2015 (UNPD)
Across ASEAN, we can observe a disparity in terms of urbanization rate— with some countries having mostly, if not fully, urbanized societies, while others remain largely rural.

We can also observe that populations are mostly concentrated near coastal areas, which can be partly attributed to their close proximity to centers of trade and commerce.
Historically, ASEAN has seen a generally decreasing trend in terms of population growth. But with more people moving to cities in search for better opportunities, we expect the urban growth rate to be higher than the national average.

Also, erratic growth trends can also be observed in smaller ASEAN nations, such as Singapore due to factors like migration movements.
Despite the declining trend over the past two decades, the challenge remains over the availability of affordable and adequate housing for the poor. This shows that behind the picture of economic growth, the issue of inequality is still a big concern.
### Targets and Goals

**Sustainable Development Goal 11**

Make cities and human settlements inclusive, safe, resilient and sustainable

<table>
<thead>
<tr>
<th>Goal 11 Targets</th>
<th>Pillars of Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1 Adequate, safe and affordable housing</td>
<td>Inclusive Growth (Economic)</td>
</tr>
<tr>
<td>11.2 Accessible and sustainable transport systems for all</td>
<td>Inclusive Growth (Economic)</td>
</tr>
<tr>
<td></td>
<td>Safe and Resilient (Social)</td>
</tr>
<tr>
<td>11.3 Inclusive and sustainable urbanization</td>
<td>Inclusive Growth (Economic)</td>
</tr>
<tr>
<td></td>
<td>Green and Sustainable (Environmental)</td>
</tr>
<tr>
<td>11.4 Safeguard the world’s cultural and natural heritage</td>
<td>Safe and Resilient (Social)</td>
</tr>
<tr>
<td>11.5 Reduce the number of people affected by disasters</td>
<td>Safe and Resilient (Social)</td>
</tr>
<tr>
<td>11.6 Reduce the environmental impact of cities</td>
<td>Green and Sustainable (Environmental)</td>
</tr>
</tbody>
</table>
Inclusive Growth (Economic)

Increasing Economic Significance of ASEAN in the Global Economy

Composition of Global Economy by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>1990</th>
<th>2017</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASEAN</td>
<td>10.15%</td>
<td>6.54%</td>
<td>3.16%</td>
</tr>
<tr>
<td>South Asia</td>
<td>2.97%</td>
<td>7.78%</td>
<td>7.33%</td>
</tr>
<tr>
<td>East Asia</td>
<td>4.73%</td>
<td>3.16%</td>
<td>23.41%</td>
</tr>
<tr>
<td>Europe</td>
<td></td>
<td></td>
<td>30.12%</td>
</tr>
<tr>
<td>North America</td>
<td></td>
<td></td>
<td>21.59%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Asia and Developing Countries as Future Global Growth Drivers

Average Growth Rate (2011-2016)

- South Asia: 6.54%
- ASEAN: 4.92%
- East Asia: 4.39%
- Sub-Saharan Africa: 3.63%
- Middle East: 3.11%
- North America: 2.02%
- Latin America: 1.73%
- Europe: 1.45%

Together with its East and South Asian neighbors, ASEAN’s share (red) to the global economy is poised to increase in the future. It is also expected that much of future economic growth will be driven by the rise in income in developing and emerging countries.
Inclusive Growth (Economic)

GDP per capita of Southeast Asian Nations in terms of purchasing power parity (constant 2011 $)

All ASEAN countries, with the exception of Brunei, experienced increasing levels of income over the past two decades, with most of the growth coming from the last ten years.

Structural Transformation

Employment Composition by Sector (% of total employment)

All of the countries in ASEAN have seen their labor force shift from mostly agricultural in 1990 to increasingly becoming more manufacturing- and service-oriented by 2010.
Inclusive Growth (Economic)

Poverty and Inequality as a Persisting Challenge

The top 20% of population accounts for more or less half of each of the countries' total incomes.

This reveals a deeply rooted problem behind the stellar economic performance of ASEAN in recent years.

Despite the dramatic improvement in percentage of poor people in ASEAN, the absolute number remains high.

Moreover, fertility rates are higher in poorer households, resulting in deeper poverty.
There is generally an increasing trend in CO2 emissions from 1991-2013, with the exceptions of 1998 after the Asian financial crisis and 2013 following the mining export ban in Indonesia.

We can observe a dip in growth after 1997 due to the Asian Financial Crisis. There is also a general trend of decline after 2010 as countries have become more aware of carbon’s impact to global climate change.
There is a strong correlation between a country’s GDP per capita and energy use per capita. Highly urbanized countries also tend to have higher energy use per capita.

Globally, cities occupy just 3 percent of the Earth’s land, but account for 60-80 percent of energy consumption and 75 percent of carbon emissions.

Most of these emissions are attributable to the cities mainly because urban areas are centers of commerce and industry.

Hence, cities are critical in addressing climate change and other environmental issues our generation is facing.
It is important to note the dramatic shift from the use of oil and coal to natural gas. New and efficient natural gas power plant emits 50% to 60% less CO2 compared to a typical new coal plant.

Renewables remains stable in share, though expected to increase in the future due to its greater availability and lowering cost.
Green and Sustainable (Environmental)

The worsening condition of air pollution in cities is increasingly becoming a major challenge for ASEAN. And according to a WHO report, respiratory diseases are some of the major causes of death in the world.

A major contributor to this alarming situation is the existence of inefficient transportation and the growing number of private motor vehicles in ASEAN. These has direct impact on the urban lifestyle of citizens in the city.

<table>
<thead>
<tr>
<th>Country</th>
<th>1990 Mean Annual Exposure</th>
<th>2015 Mean Annual Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viet</td>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>Thail</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>Singa</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>Philip</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Myan</td>
<td>23</td>
<td>16</td>
</tr>
<tr>
<td>Mala</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Lao P</td>
<td>33</td>
<td>27</td>
</tr>
<tr>
<td>Indo</td>
<td>25</td>
<td>29</td>
</tr>
<tr>
<td>Cam</td>
<td>17</td>
<td>15</td>
</tr>
</tbody>
</table>
In general, access to basic social services has been improving in urban areas across ASEAN. These include access to the electric grid, improved water access, better sanitation facilities, health, and education. However, access to these basic services remains a challenge in rural areas.

In terms of traffic safety, results are mixed for ASEAN countries with some achieving improvements while some saw increased deaths by traffic injuries.
Safe and Resilient (Social)

DISASTER RISK RESILIENCE

Droughts, Floods, and Extreme Temperatures

6.6 million

Number of people affected annually in ASEAN (average 1990-2009)

Source: OFDA/CRED International Disaster Database

Urban land within the high-frequency flood zones

Source: Changing global patterns of urban exposure to flood and drought hazards (Liu 2015)

2000 Flood Hazard Map
2030 Flood Hazard Map

6.6 million

Number of people affected annually in ASEAN (average 1990-2009)

Source: OFDA/CRED International Disaster Database
As we can see from the maps, those areas where vulnerability to hazardous risks is high are also the areas which are densely-populated. Cities are typically located in coastal areas where trade can flourish and natural resources are high in abundance.
**LAND USE AND URBAN PLANNING**

- **Innovative Land Use and Zoning Policies**
  Increase the sustainability of cities through increasing density
  Shift from single-use zoning towards mixed-use zoning
  - This type of planning is used by highly-urbanized areas like Japan
  - This can be used by cities as a primary tool for increasing density by expanding vertically and avoiding sprawl
  - Regulations and incentives should be put in place
  - Zoning laws which regulate specific areas of land and dictate how they can be used, as opposed to simply planning land-use that broadly guides development
SOLUTIONS

Physical Infrastructure

TRANSPORTATION

• Greener Transport Infrastructure
  Transport systems account for about a quarter of ASEAN’s carbon emission, hence, it is important to address the transport problem by minimizing its climate impact.
  • Construction of new infrastructures such as electric-powered subways and trains will contribute to less carbon footprint.
  Currently, available modes of public transport in ASEAN are characterized as old and inefficient, causing air pollution in the city.
  • The shift in transport preference from these inefficient vehicles to trains and subways would materialize once the more eco-friendly and more reliable modes of transportation become available.
**Physical Infrastructure**

**TRANSPORTATION**

- **Changing Driving Behavior**
  
  Private cars account for most cars in the city. With the rise of middle class in ASEAN, we can expect that more people will have the capacity to own cars.
  - This will put more pressure to the existing road network infrastructure.
  - Moreover, changing the public’s attitude and behavior towards using private vehicles will be more challenging.

  The availability of electric vehicles and more reliable public transport can provide a better alternative to owning and driving a typical car. Also, the structure of the city is a major factor in changing the way we use transport.

  The increasing prevalence of teleworking can also contribute by reducing the demand for transport to work.
SOLUTIONS

Physical Infrastructure

ENERGY

• **Innovative Residential Solar Financing**

  If a typical household wanted solar panels installed in their roof to power their house, it would cost them tens of thousands of dollars.

  • This initial cost problem can be addressed with innovative residential solar financing system, such as the model of companies like SolarCity in the United States, to encourage more households to use clean and renewable energy.

  • This works by making households go solar-powered with the system leased to them, which can help them lower their electricity bills, and at the same time, helping their communities reduce their carbon footprint.
• Affordable Basic Services

Provision of basic services is necessary for poor and vulnerable household to escape from poverty. However, quality, affordability, and sustainability are major challenges, even in those areas where services are available.

ASEAN can learn from what Multilateral Investment Fund (MIF) has done in Latin America and the Caribbean, which focuses on developing market-driven business models, with a focus on partnerships and sustainability.

○ Health: partnerships with microfinance institutions and cooperatives to offer health services and education in low-income communities

○ Water & Sanitation: offered microcredit products to help thousands of families gain access to water, improve water quality and their sanitation services

○ Waste Management: initiatives such as awareness campaigns and capacity building on waste-to-energy solutions, recycling and waste value chains
• **The “Graduation” Program**

In an MIT study published in the journal *Science*, an anti-poverty program tested across several countries was shown to be effective and long-lasting. The program features a combination of productive asset transfer, consumption support, skills training, life coaching, access to savings, and health services. It aims at moving people out of extreme poverty and into sustainable livelihoods. The results show that even with the variety in geographic and institutional context, statistically significant effects were observed across key outcomes such as income, consumption, assets, and mental health. Moreover, the impact on poor households lasted even years after the end of the intervention.

Despite the relatively expensive cost of the program, the combination of activities is necessary and sufficient to obtain persistent impact. The extra earnings, even on discounted terms, exceed the program cost proving the intervention cost-effective.
• Incentive Mechanism for Low-cost Housing

ASEAN countries can institute policies and incentives to address the issue of housing for those living in slums and informal settling.

- One such policy is Low Income Housing Tax Credit (LIHTC) adopted in several countries. The purpose of which is to promote the construction housing for low-income households. Developers can apply for tax credits/benefits, making real estate development for low-cost housing more attractive.

- Since this incentive is business-based rather than a direct subsidy, the LIHTC develops the housing market resulting to long-term viability.

- On the part of the households, comprehensive house financing support and targeted fiscal incentives for those who lack financial security can also be provided to facilitate home ownership or rental.
• **Targeting Risk Reductions**

A project initiative by the World Bank for Indonesia, InaSAFE, can be used to produce realistic natural hazard impact scenarios for better planning, preparedness and response activities.

- It was put to test in the 2012 flood season in Jakarta, and its successes provoked a rapid and widespread interest from the international community.

- This project is an open, easy-to-use tool for creating impact assessments for targeted risk reduction. The assessments are based on how an impact layer – such as a tsunami, flood, or earthquake – affects population, etc.

- Furthermore, users of InaSAFE can generate maps and statistical information that can be easily disseminated and even fed back into projects like GeoNode for simple, open source sharing (Kyte, 2014)
What-IF Analysis

Addressing the Environmental Challenge

### Primary Energy Demand Mix

<table>
<thead>
<tr>
<th></th>
<th>Current Policies Scenario</th>
<th>Proposed Policies Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2016</strong></td>
<td>74% 26% 643</td>
<td>74% 26% 643</td>
</tr>
<tr>
<td><strong>2025</strong></td>
<td>77% 23% 823</td>
<td>76% 24% 732</td>
</tr>
<tr>
<td><strong>2040</strong></td>
<td>79% 21% 1133</td>
<td>59% 41% 891</td>
</tr>
</tbody>
</table>

With our solutions on greener transportation modes, reduced need for mobility due to higher density in urban areas, and residential solar financing, together with the trend of increasing government support for renewables, we can expect more efficiency and reduced carbon intensity of energy use.

*Final energy consumption refers to total energy consumed by end users, such as households and industry. It is the energy which reaches the final consumer's door and excludes that which is used by the energy sector itself (e.g. transformation, distribution, generation, transmission, and other losses). [Eurostat]*

Sources: International Energy Agency (2017 Southeast Asian Energy Outlook)
What-IF Analysis

Addressing the Poverty Challenge

Impact of the “Graduation” Program to the Lives of the Poor

Between 75% and 98% of participants graduated from extreme poverty, with lending and technical assistance to expand financial inclusion in more than 70 countries.

**HIGHER INCOME** (monthly, in US$ PPP)

<table>
<thead>
<tr>
<th></th>
<th>2 years after the intervention</th>
<th>3 years after the intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>217</td>
<td>205</td>
</tr>
<tr>
<td>Treatment</td>
<td>263</td>
<td>249</td>
</tr>
</tbody>
</table>

**GREATER ACCESS TO FOOD**

- **Consumption**
  - After 2 years: 5.8% increase
  - After 3 years: 4.9% increase

- **Food**
  - After 2 years: 7.5% increase
  - After 3 years: 6.4% increase

- **Non-food**
  - After 2 years: 2.1% increase
  - After 3 years: 2.6% increase

**FINANCIAL INCLUSION**

- **Savings Account Average Balance**
  - 129% increase

In addition to these effects, recipients of the program saw improved physical and mental health. They also reported higher levels of overall self-rated “happiness”.

*Impact evaluations through randomized control trials were done in Peru, Honduras, Ghana, Ethiopia, India, and Pakistan.


*A multifaceted program causes lasting progress for the very poor: Evidence from six countries.
Addressing the Housing Challenge

Even with the declining trend of the percentage of urban populations living in slums, there is still a need to address the rising number of urban poor.

One major component of this solution to address the housing backlog is the promotion of affordable housing through supply and demand side support.

Price-to-Income Ratio* of Selected ASEAN and East Asian Cities

*Price-to-income ratio pertains to the ratio of median home prices and median family income in a given area.

Sources: World Urbanization Prospects 2016 (UNPD), Access to Affordable and Low-Income Housing in East Asia and the Pacific (World Bank 2014), Urban Poverty in Asia (ADB 2014), UN-HABITAT, McKinsey Global Institute
References

DATA REFERENCES:
World Bank – World Development Indicators 2017 Update
UN Population Division – World Urbanization Prospects 2014
WorldPop Project – Gridded Global Population Mapping
UN Habitat; World Economic Forum; International Monetary Fund
International Energy Agency, McKinsey Global Institute

REFERENCE LINKS FOR SOLUTIONS:
http://www.mass.gov/hed/housing/affordable-rent/low-income-housing-tax-credit-lihtc.html
http://www.sustainablecitiesinstitute.org/topics/land-use-and-planning/land-use-and-planning-sustainability-strategies
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