HONG KONG
CONTENT

1. OVERVIEW

1. DISASTER HAPPENING HISTORY

2. DISASTER REDUCTION MEASURES IMPLEMENTED

3. NEW CHALLENGES
Where we are?
Hong Kong Demographics

- Total area: 1106.34 square kilometres
- Land developed: less than 25%
- Country parks and nature reserves: 40%

Hong Kong is one of the most densely populated areas in the world, with an overall density of some 6,300 people per square kilometre. At the same time, Hong Kong has one of the world's lowest birth rates—1.11 per woman of child-bearing age as of 2012, far below the replacement rate of 2.1. Wikipedia

GNI per capita: 64,100 PPP dollars (2017) World Bank
Life expectancy: 84.23 years (2016) World Bank
Fertility rate: 1.20 births per woman (2016) World Bank
Population growth rate: 0.8% annual change (2017) World Bank
Official languages: Chinese, English

<table>
<thead>
<tr>
<th>Ethnic group</th>
<th>2006 By-census Number</th>
<th>2006 By-census %</th>
<th>2011 Census Number</th>
<th>2011 Census %</th>
<th>2016 By-census Number</th>
<th>2016 By-census %</th>
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</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>6,522,148</td>
<td>95.0</td>
<td>6,620,393</td>
<td>93.6</td>
<td>6,752,202</td>
<td>92.0</td>
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<td>Filipino</td>
<td>112,453</td>
<td>1.6</td>
<td>133,018</td>
<td>1.9</td>
<td>184,081</td>
<td>2.5</td>
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<td>Indonesian</td>
<td>87,840</td>
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<td>133,377</td>
<td>1.9</td>
<td>153,299</td>
<td>2.1</td>
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<td>55,236</td>
<td>0.8</td>
<td>58,209</td>
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<td>Indian</td>
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<td>28,616</td>
<td>0.4</td>
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<td>Nepalese</td>
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<td>16,518</td>
<td>0.2</td>
<td>25,472</td>
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<td>Pakistani</td>
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<td>18,042</td>
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<td>18,094</td>
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<td>Thai</td>
<td>11,900</td>
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<td>11,213</td>
<td>0.2</td>
<td>10,215</td>
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<td>Japanese</td>
<td>13,189</td>
<td>0.2</td>
<td>12,580</td>
<td>0.2</td>
<td>9,976</td>
<td>0.1</td>
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<tr>
<td>Other Asian</td>
<td>12,663</td>
<td>0.2</td>
<td>12,247</td>
<td>0.2</td>
<td>19,589</td>
<td>0.3</td>
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<tr>
<td>Others</td>
<td>20,264</td>
<td>0.3</td>
<td>30,336</td>
<td>0.4</td>
<td>68,986</td>
<td>0.9</td>
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<tr>
<td>Total</td>
<td>6,864,346</td>
<td></td>
<td>7,071,576</td>
<td></td>
<td>7,336,585</td>
<td></td>
</tr>
</tbody>
</table>

Source: Hong Kong Government - Census and Statistics Department, Hong Kong
Man Made Disasters

Fire
SHEK KIP MEI

DECEMBER 25, 1953
THE MAJOR FIRE ON 25/12/1953 DESTROYED THE SHEK KIP MEI SHANTYTOWN / SQUATTER AREAS LEAVING 53,000 PEOPLE HOMELESS.

<table>
<thead>
<tr>
<th>Type</th>
<th>Managed by</th>
<th>Units</th>
<th>Population</th>
<th>Population %</th>
</tr>
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<tbody>
<tr>
<td>Public Rental Housing</td>
<td>Hong Kong Housing Authority</td>
<td>749400</td>
<td>2022000</td>
<td>28%</td>
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<tr>
<td>Public Rental Housing</td>
<td>Hong Kong Housing Society</td>
<td>31279</td>
<td>82095</td>
<td>1.1%</td>
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<tr>
<td>Flat-for-sale Scheme</td>
<td>Hong Kong Housing Society</td>
<td>10360</td>
<td>20875</td>
<td>0.28%</td>
</tr>
<tr>
<td>Sandwich Class Housing Scheme</td>
<td>Hong Kong Housing Society</td>
<td>8920</td>
<td>14760</td>
<td>0.2%</td>
</tr>
</tbody>
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POPULATION LIVING AT PUBLIC HOUSING APPROXIMATELY 2.14M (NEARLY 30%)
Garley Building Fire

NOVEMBER 20, 1996
A 16 Storeys High Commercial Building on Fire
AMOYCAN INDUSTRIAL CENTRE

JUNE 21, 2016
THE AMOYCAN INDUSTRIAL CENTRE FIRE BEGAN ON 21 JUNE 2016 WITH MORE THAN 200 MINI-STORES INSIDE THE BUILDING. THE FIRE HAD BEEN BURNED FOR MORE THAN 100 HOURS AND CLAIMED 2 FIREMEN’S LIVES.

THE FIRE CODE IS UNDER REVIEW.....

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POPULATION LIVING AT PUBLIC HOUSING APPROXIMATELY 2.14M (NEARLY 30%)
N a t u r a l D i s a s t e r s

Landslide
PO SHAN ROAD

1972
A serious of landslides happened in June 1972 in HK caused at least 156 people lost their lives including the 67 people killed in the above Po Shan Road Landslide.

The landslides had ben caused by waterlogged soils in the area, a result of Typhoon Rose bringing unusually heavy rainfall in August, 1971 as well as heavy rainstorms hitting HK on the days before the disaster.

This led to the guidelines for hillside excavation and safety & rescue procedures.
Natural Disasters

Flooding
SHEUNG WAN
&
WANCHAI
EVERY TIME WHEN THERE WAS HEAVY RAINFALL (MORE THAN 20MM) SHEUNG WAN IS ONE OF THE MAJOR SUFFERED REGION
DISASTER RISK REDUCTION

- Early Warning System
- Mitigation Measure
- Build Critical Infrastructures
- Improve the Vulnerability

- Emergency and Storm Damage Organisation (ESDO) operates round the clock to handle emergencies and floods.
  - In adverse weather conditions, the Emergency Control Centre is activated to coordinate disseminating information relating to emergencies and allocation of resources to deal with extreme situations and to liaise with other government emergency units.
  - During heavy rainstorms, stormwater in some urban areas is diverted to storage tanks for temporary storage to relieve the burden of downstream drainage systems.
  - Stormwater storage schemes at Tai Hang Tung, Sheung Wan and Happy Valley are in operation.
  - In rural areas, 27 village flood protection schemes are currently in operation, protecting 35 low-lying villages against flood hazards.
  - Low-lying village are enclosed by flood protection embankments. Runoffs within villages are stored temporarily in flood storage ponds during heavy rainstorms and subsequently discharged by pumping stations.

- Stormwater is intercepted at upstream and diverted for direct discharge into the sea or rivers, thereby substantially mitigating the flood risk in downstream areas.
  - Four drainage tunnels, including the Kai Tak Transfer Scheme, and Hong Kong West, Lai Chi Kok and Tsuen Wan Drainage Tunnels, totaling about 21 kilometres in length, have been in operation for years.
  - Drainage improvement works are carried out to straighten, widen and deepen rivers and to construct or enlarge underground drains.
  - Over 100 kilometres of rivers have been improved and about 93 kilometres of drains upgraded to date.
SPONGE CITY

Sponge City means that a city could function like a sponge that has great “resilience” to environmental changes and natural disaster. The stormwater could be absorbed, stored, infiltrated and cleaned during rainy days, and could be “released” and utilised as needed to enhance the ecological function of the city and reduce the flooding in the city.

Sponge City is a modern stormwater management approach which allows the city to collect rainwater and use the stored rainwater when needed. This concept advocates reducing urban development through natural drainage of rain to avoid large scale artificial channel improvement works.

The Flood Retention Lake serving flood control, leisure and rainwater harvesting functions. It will store stormwater during heavy rains to reduce the flood risk downstream, and some of the lake water will be used as irrigation and other non-potable purposes after suitable treatment. This project also provide scenic waterscape environment for residents for public enjoyment.
Natural Disasters

Typhoon / Cyclone
<table>
<thead>
<tr>
<th>Typhoons with signal No. 10 since 1946</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date</strong></td>
</tr>
<tr>
<td><strong>Vicente</strong></td>
</tr>
<tr>
<td><strong>York</strong></td>
</tr>
<tr>
<td><strong>Ellen</strong></td>
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<tr>
<td><strong>Hope</strong></td>
</tr>
<tr>
<td><strong>Elsie</strong></td>
</tr>
<tr>
<td><strong>Rose</strong></td>
</tr>
<tr>
<td><strong>Shirley</strong></td>
</tr>
<tr>
<td><strong>Dot</strong></td>
</tr>
<tr>
<td><strong>Ruby</strong></td>
</tr>
<tr>
<td><strong>Wanda</strong></td>
</tr>
<tr>
<td><strong>Alice</strong></td>
</tr>
<tr>
<td><strong>Mary</strong></td>
</tr>
<tr>
<td><strong>Gloria</strong></td>
</tr>
<tr>
<td><strong>No name</strong></td>
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</tbody>
</table>

Source: Hong Kong Observatory
TYPHOON WANDA

SEPTEMBER 1, 1962

https://youtu.be/IyqCFUlaI44
Typhoon Wanda caused 434 deaths and left 72,000 people homeless. There was never a finalized damage total, although it was estimated in the millions of dollars and over 2,000 boats in the colony were either wrecked or damaged.

This led to the government reclaiming up some of the low area 3 m from the sea level.
TYPHOON HATO

AUGUST, 2017

https://youtu.be/VlJoUBmzBKQ
TYPHOON MANGKHUT
SEPTEMBER 2018

https://youtu.be/AeLYre_yCA8
https://youtu.be/aP9z1Cs_5Xs
https://youtu.be/Rlf2rVrmPSo
PROBLEMS FACING DURING TYPHOON

FLOODING
BUILDINGS SHAKING
TREE FELLING
BROKEN GLASSES

……
ARCASIA EMERGENCY ARCHITECTS
MAY 27, 2006 6.3 MAG EARTHQUAKE
STRUCK YOGYAKARTA
5,000 PEOPLE KILLED
100,000 HOMES DESTROYED
200,000 OTHER HOMES DAMAGED

THE NGELEPEN VILLAGE WAS FORCED
TO BE RELOCATED BECAUSE OF
LANDSLIDES CAUSED BY EARTHQUAKE
THE NEW NGELEPEN VILLAGE
81 NEW BUILDINGS DONATED BY USA
PROBLEMS:

INADEQUATE VENTILATION
LACK OF FLEXIBILITY
WHAT WILL YOU DO AS AN ARCHITECT?
EXPERT IN HONG KONG

http://web5.arch.cuhk.edu.hk/server1/staff1/edward/www/1u1v/files/fraternity/zhujingxiang.html
MORE IS MORE

THANK YOU