

LCQ8: Addressing the threats of inundation

Following is a question by the Hon Kenneth Lau and a written reply by the Secretary for Development, Mr Michael Wong, in the Legislative Council today (December 18):

Question:

Some scientists have pointed out that global warming has resulted in the sea level rising continuously. It has been reported that according to the findings of a recent projection made with a new digital elevation model for geographic information, it is forecast that under high carbon emission scenarios, by 2050, up to 340 million people worldwide will be exposed to the threats of sea level rise. By then, extensive areas in Hong Kong (including Kam Tin, Hung Shui Kiu, Tseung Kwan O, the airport in Chek Lap Kok, Kai Tak, Kowloon East and Kowloon West) may face permanent inundation. In respect of addressing the threats of inundation, will the Government inform this Council:

(1) given that the Government has earmarked \$300 million to develop a Common Spatial Data Infrastructure and a three-dimensional digital map of the whole territory, and the project may help in the prediction of areas to be affected by flooding, whether the project will collect, process and analyse data on climate change and sea level rise, as well as on the flooding risks of various districts; if so, of the details; if not, the reasons for that;

(2) of the measures put in place to further promote the use of innovation and technology in addressing the threats of inundation in various districts brought about by global warming; and

(3) as the Civil Engineering and Development Department commissioned a consultant in April this year to undertake a feasibility study entitled "Coastal Hazards under Climate Change and Extreme Weather and Formulation of Improvement Measures", whether the scope of the study covers all the aforesaid districts; if so, of the details; if not, the reasons for that; when the findings of the study will be published?

Reply:

President,

As climate change goes drastic, threats induced by extreme weather are expected to be more frequent and severe, to which the Government has been attached great importance. To step up climate actions and to draw up long-term policies, the Government established an inter-departmental Steering Committee on Climate Change (SCCC) under the chairmanship of the Chief Secretary for Administration to steer and co-ordinate the climate actions of

various bureaux and departments in April 2016. The Government also announced the Hong Kong's Climate Action Plan 2030+ in January 2017, setting out in details the new targets and key measures on mitigation, adaptation and resilience to combat climate change. Under the directive of the SCCC, the Climate Change Working Group on Infrastructure was formed to co-ordinate efforts among works departments to combat the adverse effects brought by climate change and extreme weather on government infrastructures.

The Government noted a recent report published by a foreign agency stating that there could be widespread flooding in Hong Kong coastal areas by 2050. Based on the observations of the Hong Kong Observatory (HKO), the global digital elevation model adopted by the concerned research institute has not taken into account the local measured data in Hong Kong. The application of such model in the Hong Kong areas may cause considerable limitations and uncertainties in the prediction.

Having consulted the advice from relevant bureaux and departments, we provide a consolidated response to the various parts of the question raised by the Hon Lau below:

(1) The Government has announced in the Smart City Blueprint for Hong Kong to develop a Common Spatial Data Infrastructure (CSDI) and three-dimensional (3D) digital map to provide government departments as well as public and private organisations with an information infrastructure to share spatial data, supporting various smart city applications. According to the development progress of the CSDI and the 3D digital map, it is anticipated that spatial data to be released through the CSDI after 2022 will cover across different government bureaux and departments (B/Ds). B/Ds and public and private organisations can effectively incorporate relevant spatial data into the 3D digital map, which will be rolled out by 2023, to support a wide range of smart city's application and analyses. Relevant weather and flooding data, such as rainfall intensity and tidal data, can be consolidated and released through the CSDI to facilitate relevant B/Ds to evaluate effect of flooding arising from weather change and formulate contingency measures.

(2) Government departments have been proactively introducing innovative technologies to enhance the capability of infrastructure in coping with climate change and extreme weather. Apart from the CSDI and the 3D digital map mentioned in the above item (1), the Drainage Services Department (DSD) adopts the state-of-the-art numerical hydraulic models to review the existing drainage system under the ongoing Drainage Master Plan Review Studies to formulate drainage improvement measures. This will further enhance the stormwater drainage capacity and hence reduce the risk of flooding. The DSD also makes good use of technology to co-ordinate emergency clearance of blocked drains and watercourses throughout the territory. For instance, the performance of crucial hydraulic structures will be closely monitored by telemetry and video. Water levels of major rivers and channels are also real-time monitored under the Flood Monitoring and Reporting System. Rainfall, tide levels and water levels data are collected at the sites and continuously sent back to the monitoring centre. With these real-time hydraulic data, the DSD can quickly analyse any flooding situation and, when necessary, timely

liaise with other departments for their planning and arrangement of rescue, evacuation and flood shelters as appropriate. In addition, the DSD and relevant departments have set up an early alert system at storm surge spots and overtopping wave spots. According to the alert system, the HKO will issue early alert to relevant persons regarding the forecast of storm surge and water level by SMS. On the other hand, the Civil Engineering and Development Department (CEDD) has introduced advanced surveying technology including imaging sonar, integrated multi-beam echo sounder and laser scanning system, as well as unmanned aerial vehicle to inspect marine structures effectively with a view to enhancing the capability of marine structures to cope with extreme weather. In an on-going study, entitled "Study on Coastal Hazards under Climate Change and Extreme Weather and Formulation of Improvement Measures", the CEDD will make reference to latest approaches and technologies adopted by advanced countries in combating climate change for infrastructure. Suitable protection measures will also be recommended in the study to alleviate the flooding risk in the coastal areas of Hong Kong.

(3) The CEDD commissioned consultants to undertake a feasibility study entitled "Study on Coastal Hazards under Climate Change and Extreme Weather and Formulation of Improvement Measures" in April 2019. The study aims to conduct a comprehensive review of the low-lying coastal or windy locations, and to carry out relevant investigations of storm surges and waves in order to assess the impacts of extreme weather on the low-lying coastal or windy locations. The consultants are reviewing the meteorological and oceanographical information such as data of tropical cyclones affecting Hong Kong in the past, sea levels, storm surge and wave conditions, etc. Computer modelling, which covers the territory-wide coastal environment of Hong Kong, will be used to analyse this information so as to gain a better understanding on the conditions of the low-lying coastal or windy locations, including Hong Kong Island areas (e.g. Eastern District, South District), Kowloon areas (e.g. Lei Yue Mun, parts of Kwun Tong coast areas), and the New Territories areas (e.g. Tseung Kwan O, Sai Kung, parts of north-west coast areas of Yuen Long), etc, under the effect of extreme weather. Based on the results of the analysis, the consultants will explore and evaluate appropriate protection measures for the low-lying coastal or windy locations. The study is scheduled for completion in about 18 months.