CONTROLLING OFFICER'S REPLY

(Question Serial No. 0183)

Head: (39) Drainage Services Department

Subhead (No. & title): Not specified

Programme: (1) Stormwater Drainage

Controlling Officer: Director of Drainage Services (MOK Wing-cheong)

Director of Bureau: Secretary for Development

Question:

Regarding the expenditure on enhancing the smart flood forecast and alert system of the Drainage Services Department, would the Government inform this Committee of the following:

(a) It is learnt that artificial intelligence (AI) has already been applied to smart flood forecasting, including the use of the self-developed Hydrometric Information System, and the installation of over 300 water level sensors and rain gauges across various districts. What is the annual expenditure since its commissioning, and how is the effectiveness of the technology assessed (including whether losses caused by flood have been reduced and whether emergency response time has changed); and

(b) What is the amount of the dedicated funding earmarked for "enhancing the smart flood forecast and alert system" in the 2026-27 Budget, and what is the expected reduction in emergency response time?

Asked by: Hon HO Chun-yin, Steven (LegCo internal reference no.: 3)

Reply:

Our reply to the Member's question is as follows:

The Drainage Services Department (DSD) has proactively applied innovative technologies in drainage works in recent years to implement the just-in-time clearance arrangement to reduce flood risk. In order to cope with the flooding threats induced by extreme weather, the DSD has proactively developed various systems to support departmental staff in flood monitoring and forecasting, including the Hydrometric Information System, the Smart Flood Forecast and Alert System, and the Artificial Intelligence (AI) Flood Monitoring System.

Hydrometric Information System

The DSD's existing Hydrometric Information System comprises over 300 water level sensors and rain gauges, providing real-time monitoring of water levels in main rivers or drainage channels, as well as rainfall across various districts. These data are instantly sent to the Hydrometric Information System, enabling DSD staff to monitor real-time water levels and rainfall via their mobile phones, so that timely and appropriate contingency measures can be

taken. Since 2024, the DSD has further extended the system to cover monitoring of flooding at road sections by installing smart sensors known as "Flood Monitoring Devices" along selected carriageways. So far, more than 100 "Flood Monitoring Devices" have been installed to monitor real-time water level on the roads. When the water level of main rivers or drainage channels, or the water level on the roads, has reached the warning level, the monitoring devices will immediately alert the DSD and relevant government departments. The DSD will deploy emergency response teams to inspect and clear blocked drains to reduce the risk of flooding. In 2025-26, the operational expenditure of the Hydrometric Information System and the Flood Monitoring Devices was about $4 million, and it is estimated that the subsequent annual operational expenditure will be similar.

Smart Flood Forecast and Alert System

To break through the limitations of traditional hydraulic models that requiring a long time for computation, the DSD's in-house team developed the Mosaic Model Map (M^3), a real-time territorial flood risk system, in 2024. Since 2025, the system has been adopted for flood risk assessments, enabling forecasts of flood risks in coastal low-lying or windy residential areas ahead of Severe or Super Typhoons, thereby facilitating advance preparations. As the system was developed and is operated by departmental staff under internal staff establishment, no additional costs are involved. To further enhance flood forecast and alert capabilities, the DSD is now collaborating with the South China University of Technology to develop the Smart Flood Forecast and Alert System, which integrates big data and advanced AI technologies to support the DSD in taking specific preventive measures and planning emergency response actions. The system is scheduled for trials in mid-2026 at 3 locations, including Lam Tsuen River in Tai Po, Wan Chai, and Tsui Ping River in Kwun Tong, enabling pre-emptive prevention and strategic emergency response to possible flooding. The development cost is estimated at around $1.3 million, which covers the operational expenditure at the 3 trial locations in 2026-27.

AI Flood Monitoring System

The DSD, in collaboration with The Hong Kong University of Science and Technology, successfully developed the AI Flood Monitoring System in 2024 by leveraging an AI large vision-language model. The system has been piloted in areas such as Chatham Road South in Tsim Sha Tsui, as well as Tai Kiu Tsuen and Tung Tau Wai Village in Yuen Long, where images captured by road closed-circuit television (CCTV) cameras are collected to detect and analyse street flooding using AI. Upon detection of flooding, the system instantly issues an alert to facilitate the prompt deployment of emergency response teams by the DSD to handle flooding incidents. Afterwards, the DSD worked with the Hong Kong Police Force (HKPF) to expand the coverage of the AI Flood Monitoring System. The system is now connected to over 300 CCTV cameras under the "SmartView" initiative of the HKPF, enhancing the DSD's effectiveness in responding to extreme weather. The development cost of the system is approximately $6 million, with an annual operational expenditure of about $1.4 million.

The DSD currently performs real-time monitoring of water levels in rivers, conducts flood forecast and monitors flooding conditions at carriageways separately through the 3 aforementioned systems, thereby making advance preparations. In 2025, most flooding cases could be resolved within 1 to 2 hours.

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