資通訊技術應用於淹水感測通報之研究及推廣

Research and Promotion of Application of Information and Communication Technology in Flood Notification

主管單位：經濟部水利署
[1]中華電信股份有限公司臺灣南區電信分公司

摘要

為提供快速且有效率的淹水資訊蒐集以及淹水警戒主動通報，水利署於民國 100 年起辦理民眾淹水預警通報系統建置規劃與通報功能研發計畫，並於 102~103 年起在既有基礎上持續加強民眾淹水警戒通報系統應用技術之研發，透過既有電信傳輸設備，研發低成本自動化淹水感測系統以達快速蒐集淹水情資之目的。104~105 年整合主動式民眾淹水預警系統至水利署既有 Google Earth 圖資，並配合提供 open data 資料格式供水利署使用；完成內外水之智慧型水尺設計及擴大建置範圍。106~107 年除研發連續式淹水感測並整合完成新版水情通報 APP，提供更多元的淹水通報機制便利防災單位應用。

今年度本計畫將持續進行技術創新研發，精進自動化淹水感測系統功能及傳輸方式，以及多元化淹水通報應用推廣，以提升淹水災情蒐集的廣度及精確度，工作項目如下：

一、主動式民眾淹水預警通報系統平台功能維運

延續歷年計畫所建置之主動式民眾淹水預警通報系統，並持續維運系統平台效能，今年度將既有電信交接箱、銅纜、熱線式及 LPWAN 等已建置點位維護操作(全區共計 123 點)及年度成效檢討，並已於 7 月全數完成維運。

二、淹水感測設備精進與研發

新增連續式淹水感測器狀態管理功能：可查詢連續式淹水感測器狀態包含淹水中、狀態良好、離線、失能、電池電力管理等警示功能，並將連續式淹水感測器狀態偵測功能整合至主動式民眾淹水預警通報系統。配合 貴署需求新增連續式淹水感測器或移位等至少 15 點位以上，最後將已建置之淹水感測器資料上傳至「水資源物聯網感測基礎雲端作業平台」。相關研發功能已於 10 月開發完成，其中因配合水利署及相關單位需求，新增連續式淹水感測器或移位等至少 15 點於 11 月完成建置。

三、元化水情通報功能維運及應用推廣

持續維運智慧水尺影像辨識系統及維運免付費電話淹水通報平台，巡檢全台智慧水尺及更新 QR Code 圖示(共計 421 點)已於 7 月全數完成，並完成配合辦理本計畫相關系統操作教育訓練至少 4 場次。

四、資通訊服務團運作

本項持續由資通信服務團執行系統維護作業，確保系統功能正常運作，並於豪雨及颱風期間配合進駐作業。統計至 108/10/31 止，資通信服務團進駐共計 9 次，進駐人力達 56 人次。統計至 108/11/6 止，簡訊及語音發送通次計 198,733 通，包括一般簡訊 193,029

則、語音則數 5,704 通。

關鍵詞：自動化淹水感測系統、低功耗廣域網路(LPWAN, Low Power Wide Area Network) 、NB-IOT 、免付費電話志工通報。

Abstract

In order to provide quick and efficient flood information collection and flood alert initiative, from 2011 onward, the Water Resources Agency (WRA) started the plan for construction of the public flood warning and notification system and the R&D plan for the flood notification system. From 2013 to 2014, it continued the R&D on the application technology of the public flood warning and notification system on the basis of the existing progress, and developed a low-cost automatic flood detection system through the existing telecommunication transmission equipment to enable rapid collection of flood information. From 2015 to 2016, WRA integrated the Flood Warning and Notification System into its existing Google Earth map information which provided the open data format for WRA's use. The intelligent water gauge for interior and exterior water measurements was designed and the range of construction was expanded. In addition to researching and developing continuous flooding detection and integration of the new version of the Hydrological Reporting APP from 106 to 107, it provided more flooding reporting mechanisms to facilitate the application of disaster prevention units.

This year, the plan will continue to carry out technological innovation research and development, improve the function and transmission method of the automated flood sensing system, and diversify the application and promotion of flood notification, in order to improve the breadth and accuracy of flood flood collection. The work items are as follows：

1. Functional maintenance of the Flood Warning and Notification System platform

Continuing the proactive public flood warning and notification system built over the years, and continuing to maintain the platform performance of the transportation system, this year will have established maintenance operations such as telecommunication transfer boxes, copper cables, hotlines and LPWAN (The district has a total of 123 points) and annual effectiveness review, and the maintenance has been completed in July.

2. Advancement and development of flood sensing equipment

New continuous flood sensor status management function: query the continuous flood sensor status including warning functions such as flood, good status, offline, disability, battery power management, etc., and the continuous flood sensor Device status detection function is integrated into the active public flood warning system. In accordance with the needs of your department, add continuous flooding sensors or shifting at least 15 points or more. Finally, upload the built flooding sensor data to the "Water Resources Internet of Things Sensing Basic Cloud Operation Platform". Relevant research and development functions have been developed in October. Among them, in order to meet the needs of the Water Resources Department and related units, at least 15 points such as new continuous flood sensors or

displacement were completed in November.

3. Promotion of the application of diversified flood notification

The smart water gauge image recognition system for continuous maintenance and the free phone flooding reporting platform for maintenance and maintenance. The inspection of the entire smart water gauge and the update of the QR Code icon (a total of 421 points) were completed in July, and the cooperation with this document was completed. Plan related system operation education and training at least 4 times.

4. Information and communication service operation

In this project, the system maintenance work is continuously performed by the information and communication service group to ensure the normal functioning of the system, and to cooperate with the stationing operation during heavy rains and typhoons. The statistics ended at 108/10/31, and the information and communication service group stationed a total of 9 times, and the stationed manpower reached 56 people. Statistics are up to 108/11/6, and the total number of newsletters and voice transmissions is 198,733, including 193,029 general newsletters and 5,704 voices.

Keywords：Automated flooding sensing system, IoT Low Power WAN (LPWAN), NB-IoT(Narrow Band Internet of Things),Toll-free volunteer notification.