

# IMPROVEMENT OF THE PREVENTION SYSTEM FROM THE RISKS OF FLOODING AND DEGRADATION OF THE QUALITY OF SURFACE WATER

– Tbilisi, Georgia



## In a nutshell

As climate change continues to bring increasingly severe weather events, building resilience and adaptability in cities becomes crucial. Tbilisi, Georgia’s capital, faces significant environmental challenges exacerbated by its climate and topography, characterized by steep hills and valleys. The city is particularly sensitive to heavy rainfall, which can lead to flooding and associated risks.

In response to these challenges, Tbilisi City Hall, in collaboration with the French government, has taken proactive steps to mitigate potential flood risks. They have initiated and implemented a pilot project aimed at enhancing the city’s preparedness and response capabilities. This initiative includes deploying advanced flood monitoring and early warning systems, improving drainage infrastructure, and enhancing community awareness and preparedness.

The pilot project not only seeks to prevent and limit rain-related damage to the city and its citizens but also aims to foster long-term resilience against future climate impacts. By leveraging international expertise and partnerships, Tbilisi is setting an example of proactive urban management in the face of environmental challenges, ensuring the safety and well-being of its residents while preparing for a more resilient future. This collaborative effort underscores the importance of international cooperation and innovative solutions in tackling climate-related risks in urban environments.

## Background

In June 2015, Tbilisi experienced a major flash flood, that caused the death of 20 people and 100 animals in the zoo, which was completely washed away on that occasion. This became a turning point as it was clear that more measures had to be taken to make Tbilisi more resilient and safer city.

## Description of the action

01

The main purpose of the French government funded project was to support Tbilisi to better predict and anticipate the occurrence of floods by developing a demonstrator to improve the warning system of flooding events in the City of Tbilisi. This demonstrator is based on innovative monitoring technologies for rainfall and rivers and is developed by the project team (Suez, HRrain, Tenevia)

02

Within the project, a network of 30 TV satellite antennas covering Tbilisi was installed. It provides in real time information on local rainfall estimated by each sensor, including additional measurements (temperature, humidity level, atmosphere pressure). Further it allows to interpolate the rainfall maps at city scale and prepare forecast for the next 30 and 60 minutes.

03

Moreover, hydrological monitoring through 3 CCTV cameras was introduced which provides in real-time:

- A river gauging section image treated in augmented reality,
- The corresponding water height, velocity and flow estimated through image treatment.
- A flood nowcasting implemented with the Hydrocore software developed by Tenevia (This nowcasting is based on HDrain data for the Gladni River and on NEA radar images (if provided) for the Vere River).

## Focus on

A reliable warning system for flooding events brings crucial benefits to communities and individuals alike. By providing early alerts, it allows people to evacuate swiftly, minimizing the risk of injury or loss of life. Additionally, it enables authorities to implement preventive measures such as reinforcing flood defenses and preparing emergency responses. The system also helps in safeguarding property and infrastructure by giving residents time to secure their belongings and businesses. Ultimately, a well-functioning warning system enhances community resilience, fosters preparedness, and ensures timely actions to mitigate the impact of flooding events.

## Tbilisi



**Population:**  
1.241.709

**Area:**  
726 km<sup>2</sup>

**Signatory to the  
Covenant of Mayors  
since:**  
2010

**CO<sub>2</sub> emission reduction  
target:**  
30%

## Targeted sector, climate hazard(s) and vulnerable population group addressed

**Target sectors to be addressed by the project are:** Land Use Planning, Water, Waste, Environment & Biodiversity, and Civil Protection & Emergency.

**Climate hazards to be tackled by the project are:** heavy precipitations, floods, flash floods

**Vulnerable population groups to be addressed by the project are:** adults, women and children, population without permanent jobs and low-paid populations and other target groups suffering most from natural disasters

## Achievement and advice for replication

Conduct a thorough assessment of local flood risks, vulnerable areas, and existing infrastructure to tailor flood prediction and early warning systems accordingly.



Emphasize the integration of advanced monitoring technologies such as satellite sensors, CCTV cameras for hydrological monitoring, and sophisticated software for data analysis and forecasting. Ensure these technologies are scalable and adaptable to local conditions.



Forge partnerships with technology providers, research institutions, and private sector firms specializing in meteorology, hydrology, and software development. Collaborative efforts can leverage expertise and resources for effective system implementation.



Invest in training and capacity building for local staff and stakeholders involved in operating and maintaining the flood prediction and early warning systems. Empower them with skills in data analysis, interpretation, and response coordination.



## USEFUL LINKS

<https://tbilisi.gov.ge/>

€

## Financing the project

**+** *Financing source(s):*  
French Government

**+** *Total amount:*  
735000 €

## Key figures



**30** measurement points installed



**3** CCTV cameras was introduced



An action plan for development of a full Flood Early Warning System in the City of Tbilisi was developed

## CONTACT

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