# *Strengthening Climate Information and Early Warning System in Cambodia to Support Climate Resilient Development and Adaptation to Climate Change, Battambang city*

## Background

The project design is founded on PIN's experience in technological innovation and lesson learned the development and implementation of EWS1294. Cambodian cities are highly underprepared to forecast, adapt and respond to these hazards, where the effects are further exacerbated by growing urbanization. Climate change are exacerbating effects of temperature driven hydrometeorological hazards, increasing the frequency and intensity of extreme weather events.

A lack of high-resolution topographic data and the development of effective early warning systems (EWS) is the common obstacle for urban flood disaster risk reduction (DRR) and climate change adaption (CCA) projects in developing regions. The growing availability of Digital Elevation Models (DEMs) enables the widespread application of catastrophe modelling, allowing the user to simulate geophysical hazards at varying magnitudes. Building additional channels of last-mile communication to better support vulnerable urban populations during flood events is essential for the rapid dissemination of life-saving alerts to the public during times of crisis.

## Objectives

With overall objectives, this project aims to address the flood mitigation challenge by producing evidence-based recommendations for the Royal Government of Cambodia and thereby reducing the vulnerability of urban populations to climate change impacts through an innovative and effective urban Early Warning System.

**Objective 1: Local authorities receive evidence-based flood mitigation recommendations.**

Flood modelling is used to simulate varying fluvial flow conditions and produce hazard maps that will form the basis of the flood mitigation recommendations which will be undertaken to evidence-based flood mitigation recommendations to local authority.

**Objective 2: Battambang's urban population has access to an innovative EWS.**

To build additional channels of last-mile communication to better support vulnerable urban populations during flood events by ensuring the access to Urban EWS among the population.

## Key technologies and approaches introduced

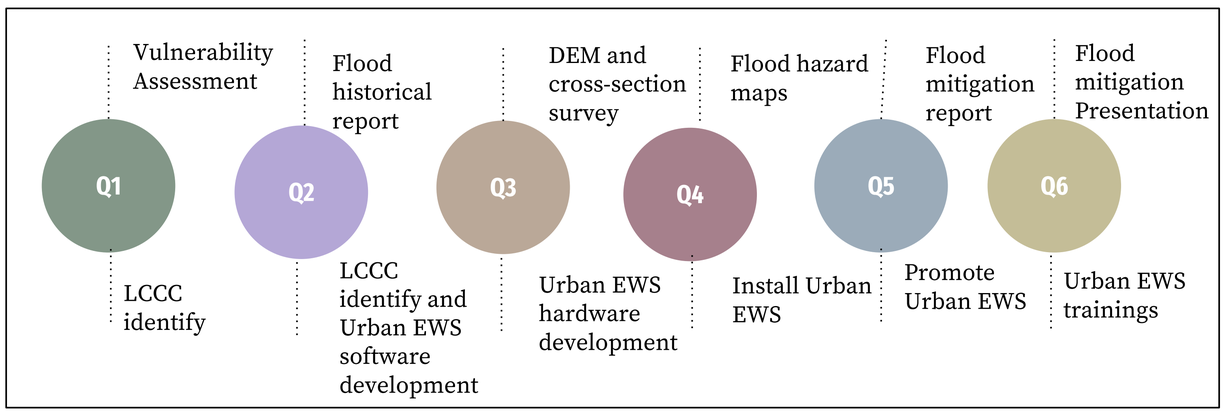
**Urban EWS development**

The creation of new communication channels is incorporated the applicable aspects of EWS1294 of which it will strengthen the existing system by making it more comprehensive. Also, an important foundation of EWS must be people centred in order to have an effective and positive impact during natural disasters. Best forecasting technology, with the most accurate data, but if EWS fails to communicate the information to the people, then the system is ineffective even the forecasting technology contains accurate data and forecasting technology.

**Flood mitigation recommendation**

Incorporating local knowledge through traditional methods remains highly important and this project therefore uses an integrated approach to produce flood mitigation recommendation. The application of more scientific methods of data collection and processing can increase the resolution of available spatial data, progressing from current satellite elevation profiles, which are currently not applicable for urban flood modelling. Drone technology cannot always be applicable for acquiring accurate terrain data that is required for surface water modelling. This project is piloting a promising new approach to urban elevation data acquisition via tuk-tuk, of which the technology is already proven to be effective within drones.

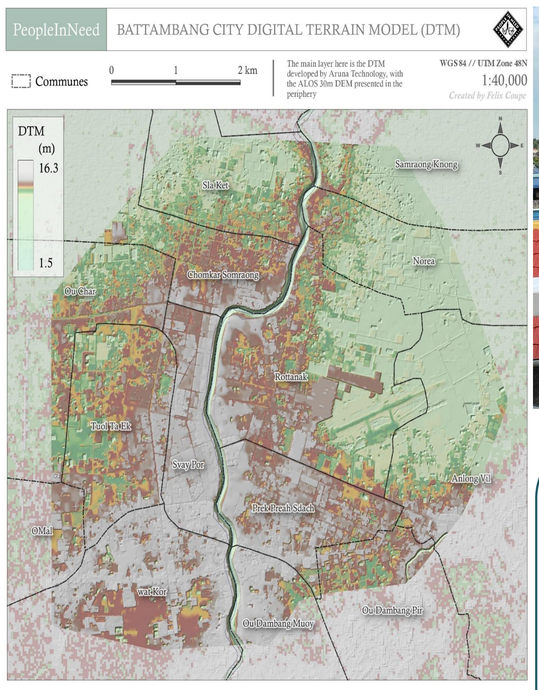
## Outputs and key activities




| **Local authorities receive evidence-based flood mitigation recommendations.** |
|---|
| Conduct a flood impact assessment |
| Generate a Digital Elevation Model of Battambang City |
| Produce flood hazard and extent maps |
| Determine flood mitigation measures and present to the relevant local authorities |

| **Battambang's urban population have access to an innovative EWS.** |
|---|
| Identify last-mile communication channel |
| Develop urban EWS |
| Ensure the urban population has access to Urban EWS |
| Build capacity to operate and maintain Urban EWS to local authorities |

## Implementation progress




**Objective 1** 85%
**Objective 2** 80%

- Urban EWS has been developed and installed at targeted areas. The Facebook follower-base has been utilizing to disseminate platform to expand the reach of people.
- Geospatial, hydrological, and meteorological data available in the Battambang region have been analyzed to develop a 2D HECRAS urban flood model of the Sangkae River to produce flood hazard and extent maps under varying flow conditions.

## Key challenges and lessons learnt

- **Key challenges**

- Inter-province travel ban due to outbreaks of Covid-19.

- Resource and schedule planning change due to the refining and retesting steps of technology development processes change.

**Lessons Learnt**

- **Sustaining existing technology and capacity building:** Being a new component to an existing project, this strengthens the existing system by making it more comprehensive, whilst empowering NCDM and PCDM through the use of a system that they already know and support.

- **Enhancing partnerships:** Through the project implementation phases, designed activities enhance partnership between national and sub-national officials and prove a success in reducing the vulnerability of urban populations to flood impacts.

- **Expanding the accessibility of vulnerable group to the information:** The methodologies which the project applied to identify last mile communication channel has been highly relevant and contributed to expanding the reach to different vulnerable groups. This can address the new public infrastructure that local levels can access to mitigate flood risks.

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