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# Enhancing thunderstorm warnings in developing countries based on lightning location data

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Thunderstorms cause annually substantial damages in developing countries, especially in the tropics and sub-tropics. People, animals, human property and infrastructure are affected by lightning strikes, heavy rainfall-related flooding and landslides as well as strong convective winds (downbursts and tornadoes). It is therefore clear that the real time monitoring of thunderstorms would enable better early warning services and therefore make possible the reducing of impacts.

Finnish Meteorological Institute (FMI) is coordinating hydro-meteorological capacity building projects in several developing countries. In case the host country is exposed to high activity of thunderstorms, one component in the projects has been to train the national hydro-meteorological service (NHMS) to use and understand real time lightning location data not only in their operational work but also in scientific examinations.

Since 2012, the concept described above has been successfully exploited in Nepal, Bhutan, Vietnam, the Pacific Island Countries (PICs), South-Sudan, Sudan and Sri Lanka, respectively. All of these countries experience a substantial amount of lightning every year and, depending on the region, also severe hydrological impacts. In this study we show (i) the principal concept of lightning location feed setup and visualization based on the needs of the local NHMS and their stakeholders, and (ii) the feedback collected from the countries.

The results indicate, for example, that lightning location data is nowadays one of the most reliable and real-time information source on thunderstorms, and that how quickly the data can be taken into operation even without the need to install local instruments or hardware.