giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

INTEGRATED DEVELOPMENT OF EARLY WARNING SYSTEMS

Innovation through Partnership

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DEUTSCHE ZUSAMMENARBEIT

GI:DRM
Global Initiative on Disaster Risk Management

Local Flood Early Warning System - LFEWS

An affordable and community-based approach with high potential for transferability

Simple and effective local flood early warning systems (LFEWS) allow local authorities and municipalities improve their ability to predict and warn of flooding events and to respond more effectively at the water catchment area level. Through the successful implementation of LFEWS in the Philippines, Vietnam and Mozambique, GIZ has demonstrated that people-centred early warning systems, which incorporate local knowledge and capacities, and have been planned, tested and are maintained together with the population, work most effectively.

Mozambique

Mozambique is one of the countries which is most strongly affected by climate change. Poverty, limited institutional development and frequent extreme weather events make Mozambique especially vulnerable.

Since 2005, simple and effective local flood early warning systems have been installed in the Central Mozambique province of Sofala. Since then, communities along the Búzi, Save and Revuè rivers are ready to deal with the recurring floods, and local people remove their belongings to a place of safety when the alert is sounded. The system uses a simple approach. Local disaster risk reduction committees are trained to monitor the river levels and send data to the district capital Búzi, where it is analysed by the Technical Council for Disaster Risk Management – a body representing different sectors, including agriculture, education, health and infrastructure planning.

This best-practice model for people-centred early warning systems, developed with the support of GIZ, has been selected as the winner of the first RISK Award, a collaboration between UNISDR, the Munich Re Foundation and the Global Risk Forum, Davos in 2012.

Lately, within a triangular cooperation initiative involving Brazilian partners, GIZ supported the modernisation of the people-centred flood early warning systems by developing and establishing low cost, robust climatic and hydrometric gauging stations that allow automatic data transmission to the key institutions, and strengthen capacities among local disaster risk management committees to get involved in early warning.

Main challenges encountered during the implementation of the LFEWS have been related to the high staff fluctuation among partner institutions impeding organisational capacity development, the difficulties to avoid vandalism and robbery of gauging stations in remote places, and the institutionalisation of the initiatives in order to secure sustainability.

Philippines

The Philippines is made up of more than 7,000 islands, and is annually affected by two monsoon seasons, and on average 9 typhoons make landfall. Those events lead to exceptional rainfall resulting in frequent flooding during monsoon times and typhoons. GIZ and their local government partners have developed an integrated approach for LFEWS in the Philippines.

The approach focuses on small to medium-sized river basins and is tailored to local conditions. Where necessary, the system may be supplemented with GIS data and satellite information. Data on the extent and frequency of rising water levels provide important information for risk maps that can be used to prepare or adapt land-use plans as well. The LFEWS combine the capacities of the national meteorological authority, local government units and the communities.

The first generation of GIZ-LFEWS was piloted in the Binahaan Watershed of Leyte Province in 2008. The system has since been replicated to seven other watersheds in Region 8 and eight other watersheds in the country. Since then, there have been observed impacts in terms of saving lives and properties, improving institutional performance of local governments and increasing public awareness.

Whilst the early warning systems were found to be effective in saving lives and moveable property, their implementation also led to further awareness about disaster mitigation measures to reduce damages to non-movables such as crops and buildings. Cost-benefit analysis undertaken by GIZ revealed that savings from avoided damages outweigh the costs of system setup very quickly, usually within the first years of operation.

Establishing LFEWS is described as a five-step process:

- Securing political consent at local government and social acceptance at community level
- Conducting a participatory disaster risk assessment
- Planning and integration of LFEWS to existing disaster risk management plans and structures
- Installing and calibration of hardware
- Implementation

The experiences and approach in setting up and management of LFEWS have been documented in a publication:
GIZ (2012): Local Flood Early Warning System, Manila, Philippines