

Flood Impact Mapping Methodology

November 2025 | South Sudan

Overview

This assessment applies an integrated **spatial detection and proximity modelling approach** to quantify the impact of floods on critical infrastructure and community services across affected counties. The analysis combines remotely sensed flood data with building and facility datasets to identify exposure levels, assess vulnerability, and inform targeted recovery planning.

Methodology

Flood detection and Facility Exposure

Flooded facilities – including administrative buildings, markets, religious centres, transport infrastructure (bus stations, airports, & riverports), water points, health facilities, education centres, and residential structures – were identified using spatial overlay analysis.

Flood extents were derived from FEWS NET flood detection data dated 30 September 2025.

Facilities located **within 100 meters** of the detected flood perimeter were classified as **flood-affected**. This proximity threshold accounts for potential uncertainty in the flood extent data and represents likely zones of physical or functional disruption.

Service Accessibility and Vulnerability Modelling

To assess the potential impact of flooding on service access and community resilience, **building proximity to essential services** was modelled using defined spatial thresholds.

Buildings **within 2 kilometres of a health facility or education facility** were considered to have adequate service access in normal conditions.

Buildings **within 1 kilometre of a**

water point were considered to have adequate water access.

These proximity parameters were applied to evaluate which settlements and facilities are **most dependent on nearby public services**, and therefore **most vulnerable** to disruption following flood events.

Data Sources

The analysis draws on multiple verified datasets:

- **Flood Data:** FEWS NET flood extent (30 September 2025).
- **Building Footprints:** Global Google–Microsoft [Global Google–Microsoft Open Buildings Dataset \(2023\)](#) accessed via the Google Earth Engine Community Catalog.
- **Facility and Vulnerability Data:** Unpublished datasets from the International Organization for Migration (IOM) Displacement Tracking Matrix (DTM), including: [South Sudan Koch Village Assessment Survey – January 2025](#), [South Sudan Leer Village Assessment Survey – January 2025](#), [South Sudan Mayendit Village Assessment Survey – January 2025](#), [South Sudan Panyijiar Village Assessment Survey – January 2025](#), and [South Sudan Guit Village Assessment Survey – January 2025](#).
- **South Sudan Administrative level data.**

Analytical Approach

All datasets were processed and analyzed in a **Geographic Information System (GIS)** environment. Spatial overlays were used to detect facility exposure to flood waters, while proximity models were applied to estimate access to critical services. This combined method provides a **detailed spatial understanding of flood exposure, infrastructure vulnerability, and service dependency**.

The resulting analysis supports recovery planning, resource prioritization, and evidence-based decision-making for humanitarian and development partners responding to the 2025 flood crisis in South Sudan.

ABOUT REACH

REACH Initiative facilitates the development of information tools and products that enhance the capacity of aid actors to make evidence-based decisions in emergency, recovery and development contexts. The methodologies used by REACH include primary data collection and in-depth analysis, and all activities are conducted through inter-agency aid coordination mechanisms. REACH is a joint initiative of IMPACT Initiatives, ACTED and the United Nations Institute for Training and Research - Operational Satellite Applications Programme (UNITAR-UNOSAT).