A two-dimensional (2D) unsteady flow hydraulic model was set up using HEC-RAS software for the two catchments in the Al-Jufaineh region. The approach allows an understanding of flood hazards on a catchment-wide scale and identify areas prone to flood risk, especially areas exposed to flash flooding. The terrain used for the HEC-RAS 2D unsteady flow analysis of the Al-Jufaineh catchment was a satellite-derived DEM product of 2.5 meters resolution. Flood hazard was obtained by multiplying depth and velocity. The flood water depth represents water flow extents and static accumulation of water in meters. It was classified into 5 flood hazard categories from very low to extreme according to the Japanese criteria of the Ministry of Land, Infrastructure, where each hazard category is associated with the risk of damage, the threat to human safety, and the possibility of evacuation. Following a collaborative approach, REACH and CCCM Partner drew site boundaries of Al-Jufaineh IDP site.