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Radar remote sensing supporting humanitarian operations – Challenges and outlooks

Natural disasters (floods, droughts), changes in environmental conditions (climate, soil, land investments), violent regional conflicts as well as population growth force people to migrate all over the world. The report of the UN Refugee Agency (UNHCR) estimates over 15 million people leaving their home country in 2012 and almost 30 million being internally displaced by conflicts. These conflicts challenge both migrants and human humanitarian organizations as many of the arising refugee camps settle and grow unplanned and mainly uncontrolled.

Remote sensing can provide valuable information for those working at refugee camps to support the local population. Organizations like Médecins Sans Frontières (MSF) participate are locally involved. To be able to help efficiently, they need reliable information about (1) the population numbers of the camp, (2) potential groundwater reservoirs and (3) the vulnerability of the local environment. However, in many of the cases, local measurements to calibrate or validate the data gained from satellites are not possible due to security and admission reasons.

This study introduces possible analyses based on the combination of microwave (TerraSAR-X, ALOS PALSAR) and short wave satellite images (RapidEye, Landsat ETM+/OLI) and especially focuses challenges such as lacking possibilities for ground trothing, acquiring remote sensing data from areas of conflict, and dealing with uncertainties within the results.