Population density - and assets mapping for human security

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Space technology aims to provide accurate, timely and relevant information to better understand and measure human security. Human security deals with risks occurring to people. While remote sensing information informs precisely about extent and exposure to specific risks, the link to the specific affected population is still a critical step in research. Knowing where people are and if they are vulnerable to specific risks are two major research questions that are addressed in Global Monitoring for Environment and Security (GMES) projects.

To address the first question, population distribution models are developed. Population density maps integrate demographic data from statistical sources with land use information derived from Earth Observation (EO) data. This spatial link to population data is an initial step to other socio-economic statistics. While population information is of poor quality, models assumptions help to identify the spatial pattern of the distribution by indirect factors. Land use information is crucial in such model. This paper demonstrates the development of such models in different research applications (ERA-Star, Wallonia World Wide Space Applications, G-Mosaic and SAFER).

The second question refers to analysis of risks and vulnerabilities. Geospatial technologies provide technological support to authorities in the prevention and post-crisis phases of emergency management cycles in natural disasters such as flood or earthquakes or in man-made disasters such as conflicts or industrial crisis. Within the Services and Applications for Emergency Response (SAFER) project, a multi-risk assets mapping portfolio has been developed and is described in this paper. This portfolio helps in preventing risks and deaths and in setting up responsible prevention measures. Assets mapping services integrate multi-criteria (either quantitative, e.g. economical damage and affected people, or qualitative, e.g. impact on environment) into EO based geo-information models of risks to be used by emergency planners. EO based geo-models combine EO data with other ancillary data such as population census, socio-economic statistics and land-use maps.

Remote Sensing products developed through GMES research projects at the European level address International Human Security. For humanitarian aid, development and environmental reasons, European Commission needs technical spatial information about risk to humans. Assets mapping makes the spatial link between population and/or assets and risks. Geospatial technologies promote European research in countries where accurate information is sometimes missing. Geospatial technology related to human well-being can support the European policy in an international context.