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A Framework on Data and Remote Sensing for Humanitarian Logistics

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Abstract : Effective humanitarian logistics operations are a cornerstone in the success of disaster relief operations. However, for effectiveness, they need to be demand driven and supported by adequate data for prioritization. Without this data operations are carried out in an ad hoc manner and eventually become chaotic. The current availability of geospatial data helps in creating models for predictive damage and vulnerability assessment, which can be of great advantage to logisticians to gain an understanding on the nature and extent of the disaster damage. This translates into actionable information on the demand for relief goods, the state of the transport infrastructure and subsequently the priority areas for relief delivery. However, due to the unpredictable nature of disasters, the accuracy in the models need improvement which can be done using remote sensing data from UAVs (Unmanned Aerial Vehicles) or satellite imagery, which again come with certain limitations. This research addresses the need for a framework to combine data from different sources to support humanitarian logistic operations and prediction models. The focus is on developing a workflow to combine data from satellites and UAVs post a disaster strike. A three-step approach is followed: first, the data requirements for logistics activities are made explicit, which is done by carrying out semi-structured interviews with on field logistics workers. Second, the limitations in current data collection tools are analyzed to develop workaround solutions by following a systems design approach. Third, the data requirements and the developed workaround solutions are fit together towards a coherent workflow. The outcome of this research will provide a new method for logisticians to have immediately accurate and reliable data to support data-driven decision making.

Keywords : unmanned aerial vehicles, damage prediction models, remote sensing, data driven decision making
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