

A priority index for humanitarian aid after a typhoon

The Priority Index is a data driven solution to predict damage to houses after a (super) typhoon or hurricane. We use data and machine learning techniques to identify priority areas for humanitarian aid. Organizations like the Red Cross and Red Crescent National Societies, governments or UN OCHA can use these results to better understand the impact of a natural disaster and to mobilize humanitarian response faster.



Damaged building due to Typhoon Haima



Timely information can save lives. Aid organisations must recognize that accurate, timely information is a form of disaster response in its own right

Niskala, Secretary – General of the [IFRC \(2003-2008\)](#)

Humanitarian aid improves with accurate and timely information

When a natural disaster strikes, the local government, NGOs and Red Cross and Red Crescent National Societies quickly need information on the damage (affected population, casualties, road blocks, flood extent, damaged houses) in the areas that were hit by the disaster. The information that is presented to decision-makers in the wake of a disaster needs to be accurate, appropriate, timely and valid.

One of the challenges with disaster response is scarcity of resources: not each affected family can be helped. Therefore it is essential to identify priority areas , by assessing damage and finding vulnerable people that are affected the most. Currently damage assessments and identification of the most vulnerable is a time consuming process, which can takes weeks to complete, due to logistics, safety constraints, or workload.

Assessment teams need to go into the affected area and interview people affected and review damage to houses. Due to time constraints, or limited information sharing, there is a risk that decisions on priority areas are not based on complete and accurate information, and thereby also organizational or political preferences could be taken into account, as well as influence by the media on areas that receive more media attention than other areas.

During a study in the Philippines [3. van Lint. (November 2016.) Sense-making of the Netherland Red Cross Priority Index Model – case typhoon haiyan, philippines. [Thesis here](#)], 60% of 32 interviewed decision makers (government, NGO's and UN) have indicated that a faster, more complete and more objective analysis of priority areas (Priority Index) could be useful to identify areas with high damage and number of people affected. Thereby supporting decision makers to prioritize and distribute aid efforts and reach the most vulnerable people in the worst affected areas more efficiently.

Building the priority index for typhoons

Our aim is to develop a methodology to identify high priority areas for humanitarian response, based on (open) secondary data of affected areas, combined with disaster impact data (such as windspeeds and rainfall) and by learning from past disasters. It is important that we invest in data preparedness, so that these pre-crisis secondary datasets are available and up-to-date ([1. ACAPS, & CDAC-Network. (2014). Assessing information & communication needs: A quick and easy guide for those working in humanitarian response (pp. 10).], [2. InterAgencyStandingCommittee. (2010). *IASC Guidelines Common Operational Datasets (CODs) in Disaster Preparedness and Response*. Paper presented at the 77th IASC Working Group meeting.]).

Applied research on this objective is ongoing for Typhoons (Philippines), Earthquakes (Nepal) and Floods (Malawi). Our objective is to develop machine learning methodologies that can be applied to different countries, using local data, and with minor modifications reach a fast and sufficiently accurate damage prediction. In this blog we describe initial results for the Philippines during Typhoon Haima on October 19th 2016.

Data

Data used for the prediction model includes country wide base line data (administrative boundaries, population, poverty, house wall and roof types), Geographical features per municipality (ruggedness, slope, coastline length, distance to coast), combined with impact data (wind speed, rainfall, typhoon path), and uses a number of specific features created from these data.

A special thanks to [Andrej Verity](#) (UN OCHA) and [Simon Johnson](#) (British Red Cross) for the ideation and initial work on Priority Index models. And to Mark Saunders (University College London) for providing the windspeed data.

Red Cross support

Grants for this research were provided by the [Prinses Margriet Fund](#) and the [Netherlands Red Cross](#).



An initiative of the Netherlands Red Cross. We want to shape the future of humanitarian aid by converting data into understanding, and put it in the hands of humanitarian relief workers, decision makers and people affected, so that they can better prepare for and cope with disasters and crises. Among our data scientists are many volunteers and their input to our work is highly appreciated.

Want to join us and have an impact in humanitarian aid through the use of data? [Contact us](#).



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