Peer Review Framework for Predictive Analytics in Humanitarian Response

MODEL REPORT:
Flood Anticipatory Action Trigger in Bangladesh

UN OCHA Centre for Humanitarian Data

June 2023

OCHA CENTRE FOR HUMANITARIAN DATA

1. Background

This report summarizes the documentation and findings of the peer review of the trigger used in UN OCHA's Bangladesh Anticipatory Action framework for floods. The impact prediction model used as a basis for this trigger was developed by the UN OCHA Centre for Humanitarian Data. The go/no-go trigger mechanism is based on the GloFAS river discharge forecasts, combined with water level forecasts by the Bangladesh Flood Forecast and Warning Centre (FFWC). To find out more, please see the Anticipatory Action Framework for Bangladesh Floods.

The review has been conducted between January and June 2023.

2. Main Findings and Recommendations

You can find all the documentation regarding the model, its application and the review process at the following links:

- The Model Card describes version 1.0 of the model and was completed in January 2023.
- The Model Evaluation Matrix was completed in March 2023 by Amy Kim, Data Scientist at Betterview, a property intelligence and risk management solution company.
- The Implementation Plan was completed in March 2023. It summarizes the concrete actions that the model will trigger or inform.
- The Ethical Matrix aims to identify all stakeholders and potential issues regarding the intended use of the model. The Ethical Matrix was completed in June 2023 by Aarathi Krishnan, Senior Advisor on Strategic Foresight at the UN Development Programme.

A summary of the main findings and recommendations is provided below.

2.1 Technical Review

Intended Use
- The definition of in-scope and out-of-scope use cases is clear, and the output of 1-in-10 year return period riverine flooding is easily interpretable.
- The constraint that flooding will occur only during the monsoon season (June - September) should be reviewed.

Model Development and Documentation
- GloFAS is a widely used, trusted and up-to-date source. In-depth research and skill analysis was performed, and justification was provided for the selection of monitoring stations.
- Household survey used to determine water level threshold needs more documentation.

Model Evaluation
- A benchmarking process should be incorporated to evaluate model performance.
- The peer review process should be completed before model deployment, rather than after.

Operational Readiness
- Readiness has been demonstrated as the model has already been deployed.
- The model and data should be monitored in order to maintain readiness.
- It would be nice for others to be able to run the GitHub repository analysis code.

2.2 Ethical Review

Inaccuracy
The assumption that historical water level is an indicator of impact and river discharge is a good predictor of water level is based on how these metrics have been used historically. It does not take into account how these two assumptions might shift or change based on emerging climate risks that might shift water levels and/or river discharge. If the model cannot account for future risks that might shock linear projections, populations bear the brunt of inaccurate data.

Statistical Bias
While the model draws from global models, it is hard to see how this is validated/contextualized to the specific areas. The implementing agencies are all multilateral excluding Bangladesh Red Crescent Society and therefore there might be a bias in how data is interpreted. Without validation or accuracy of targeted populations, there might be groups that are excluded.

Systemic Bias
Targeted population identification is based on governmental datasets, but no information has been included about how that dataset is designed. There might be a risk of groups being deliberately excluded or specifically privileged. Without validation of potential systemic bias, political bias it is likely that there might be groups deliberately excluded or harmed.

Insufficient Data
As noted above, if there is no data about how future risks might shift, the baseline data set might not represent the current risk levels. This missing data/analysis could lead to incorrect

allocations. It is recommended to consider long term impacts or risks in the next version of the trigger.

Feedback

The Centre invites individuals and organizations working in the humanitarian, academic, research and private sector to engage with us on the peer review process. Please send feedback on the Framework to centrehumdata@un.org.