Appendix: Moving toward predictive geospatial analytics for urban sanitation
UNC Water Institute's Water and Health Conference, October 2019

Contextual data

We identified 33 geospatial data sets that could be provide context for Antananarivo, Madagascar. These data sets included demographics, topography and infrastructure. Of the 33 data sets, only 16 were of high enough resolution to make them useful for localised decision making. The most useful data sets included:

- Population: we used data from WorldPop (based at the University of Southampton) who are the leading data source on population forecasts. We worked with their data to create population density estimates for our 1km^2 analysis.
- Rivers: we extracted data on the location of rivers in CUA5 from a dataset held by the United Nation's Food and Agriculture Organisation.
- Roads: we extracted data on the location of roads and pathways in CUA5 from OpenStreetMap.

We need to improve the quality of data for roads so that we can better understand the accessibility of waste removal vehicles. This will require a combination of data collection and satellite drawing. Better georeferencing during data collections (especially for health) would make more data sets useful for contextual analysis.

Risk Formula

Our risk formula was influenced by two key factors. First, our goal is to empower municipal decision makers so that they can make better decisions about where to invest resources to improve sanitation for low income communities. There are multiple ways that 'priority' can be defined. For now, we are identifying where areas where the lack of sanitation, size of population and potential for contamination of water is greatest.

Second, the risk formula was influenced by the available data. The current data allows us to award a risk rating. Additional, higher resolution data will be required to perform analysis that can inform what specific actions are required need to reduce the risk rating (e.g. the potential location of waste transfer stations).

The next stage of our work will be to gather new sanitation and contextual data in partnership with the members of our hub in Antananarivo. We will also be working with municipal decision makers to explore which visualisations are most useful for decision making and whether it is possible to create a geospatial shit flow diagram for the city.

Any questions?

We would love to discuss any questions that you have. Please contact john@gatherhub.org