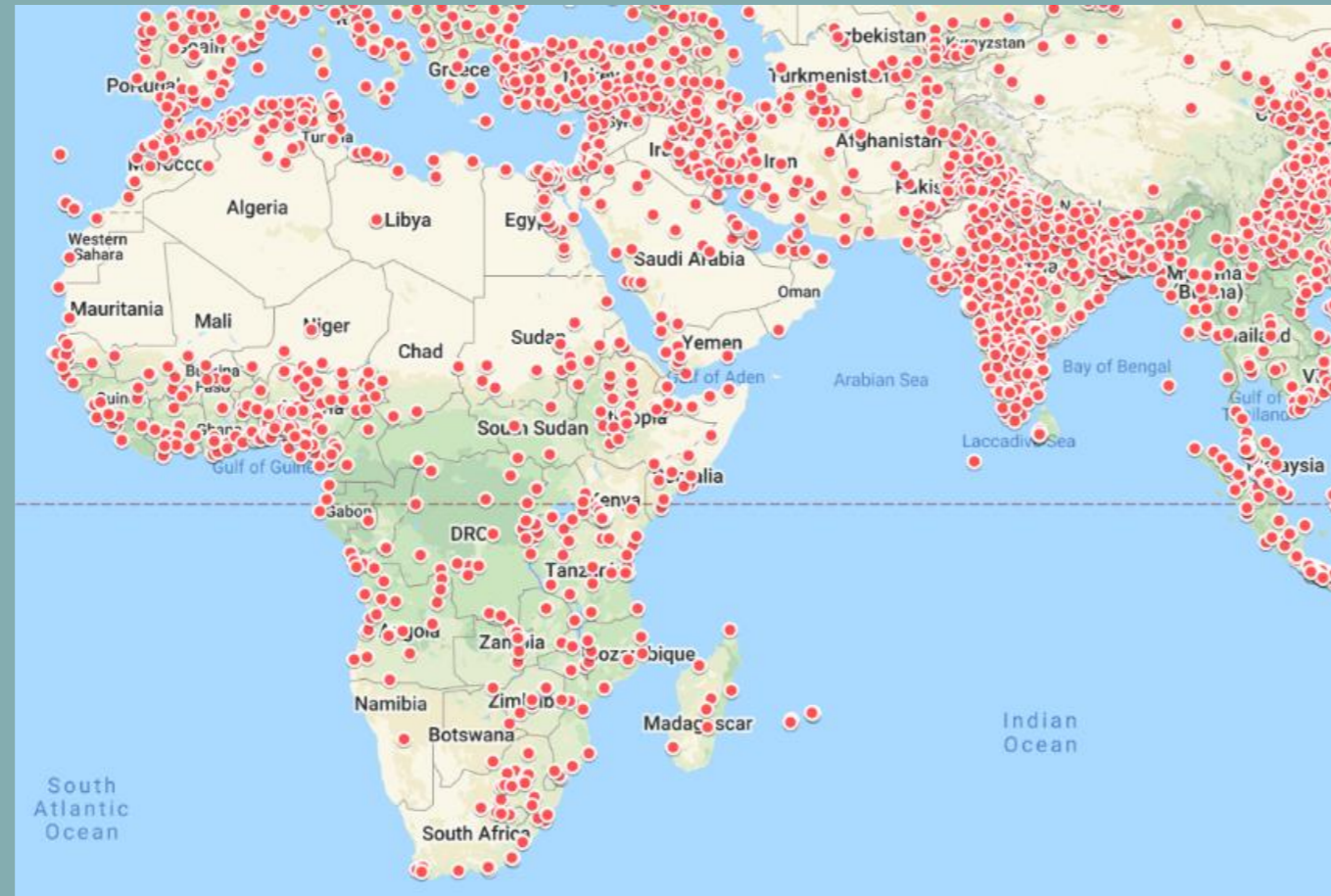


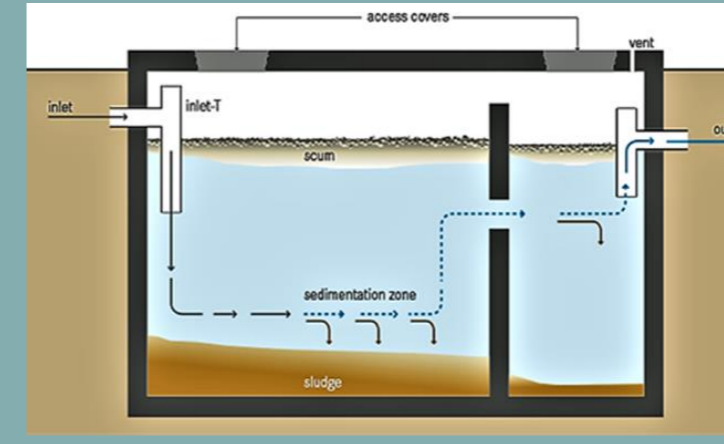
A new methodology for spatially representing sanitation systems in unsewered cities in the global south has been developed. It uses open-source data to model the amount of faecal matter produced at each building and the flow of it in local drains for a small area of Rajshahi – a secondary city in NW Bangladesh.

1 Research Need

Several sanitation management methods have been provided; however, due to a lack of data, assessment of sanitation problems in cities in developing countries have centred on a whole-city scale approach. We think the issues were more diverse, not only city-specific; the challenges are also location-specific within a city. A spatial analysis of sanitation management is necessary in order to manage sanitation systems effectively and efficiently.



Cities with 100k+ population where sanitation management is a challenge...

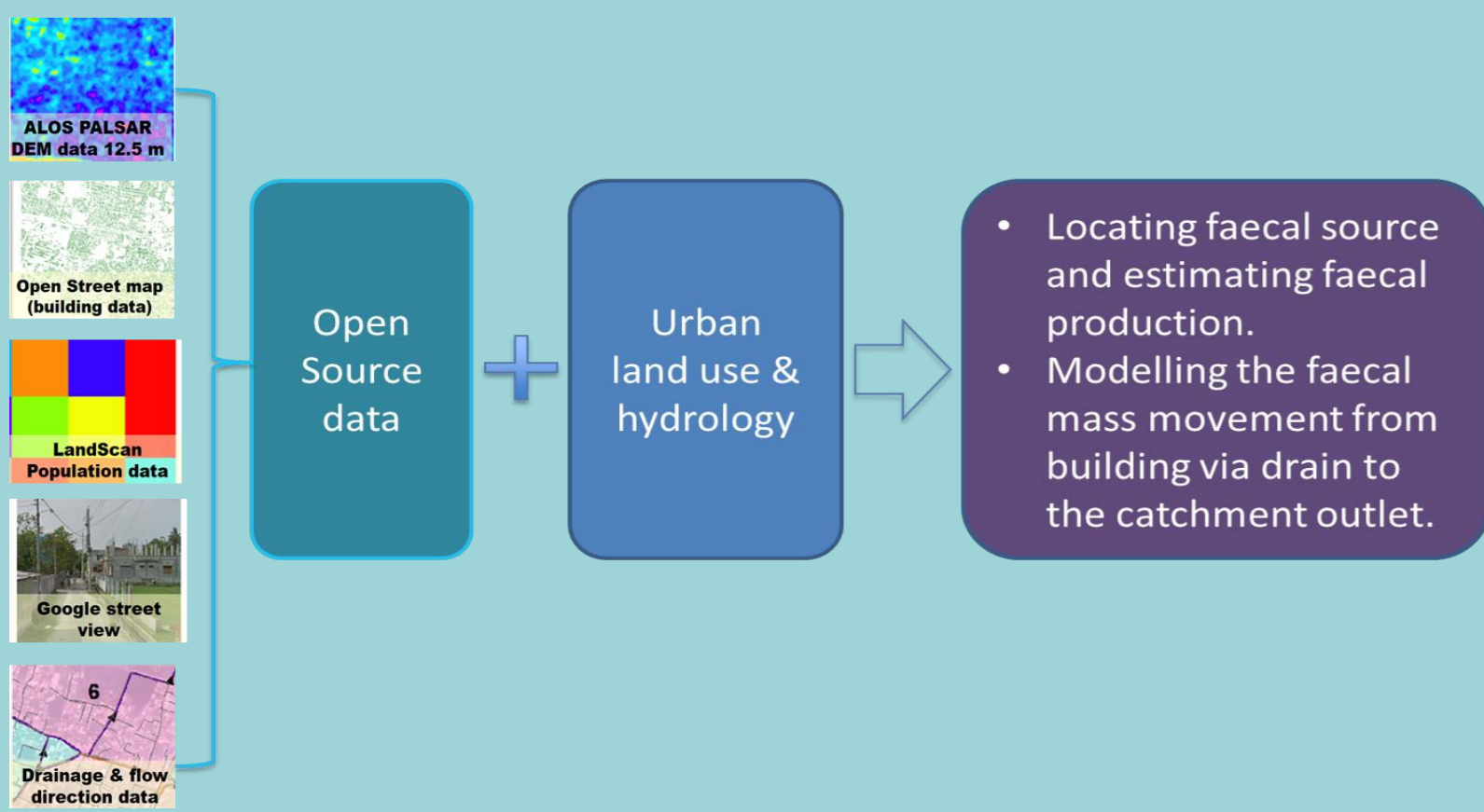


Therefore, the aim is to generate a methodology for spatial scale mapping of faecal movement in an unsewered urban areas using open-source data.



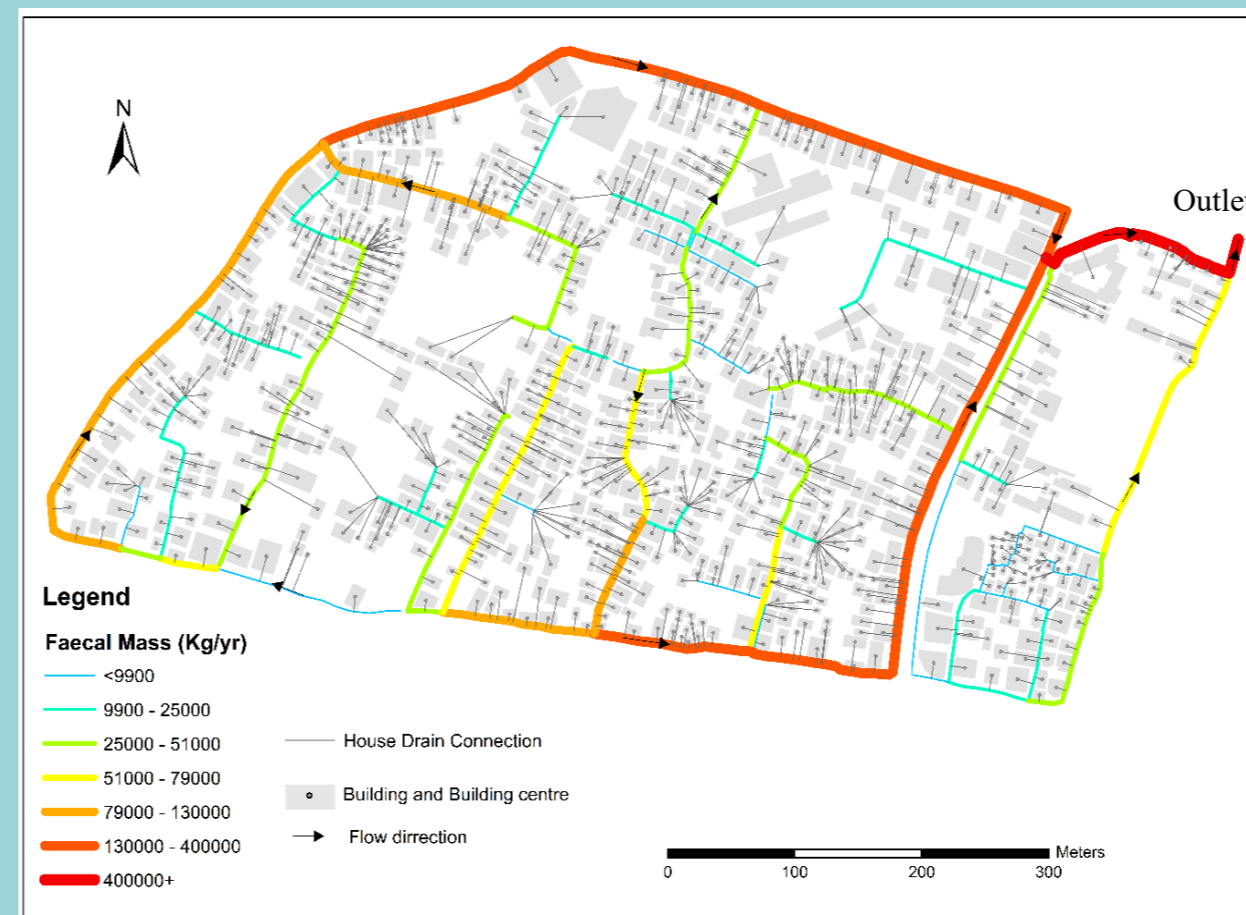
Typical urban sanitation context in Bangladesh & India

2 Method



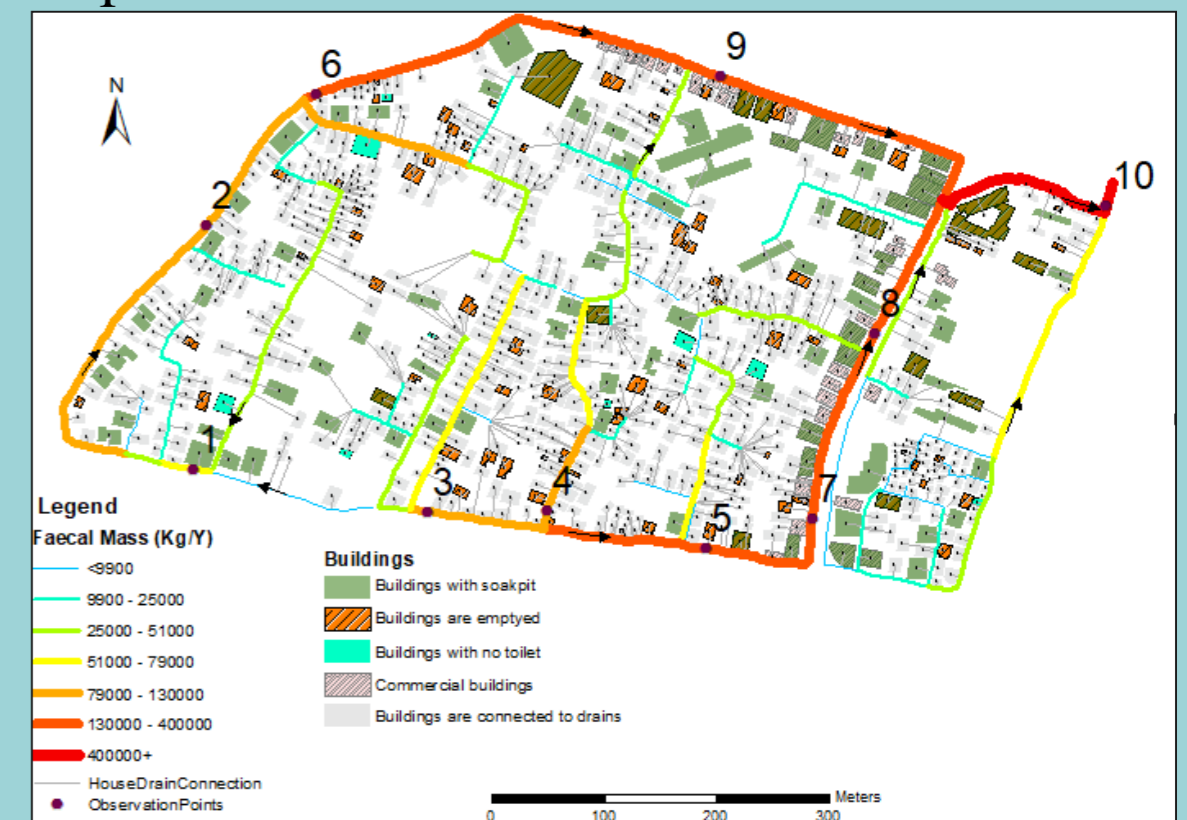
- The method involves using OpenStreet Map and Google StreetView to locate buildings, and calculating faecal volume for each building by distributing the gridded population.
- Then model the faecal movement from building to catchment outlet through the drain using network modelling.

3 Spatial Representation of Faecal Matter Movement

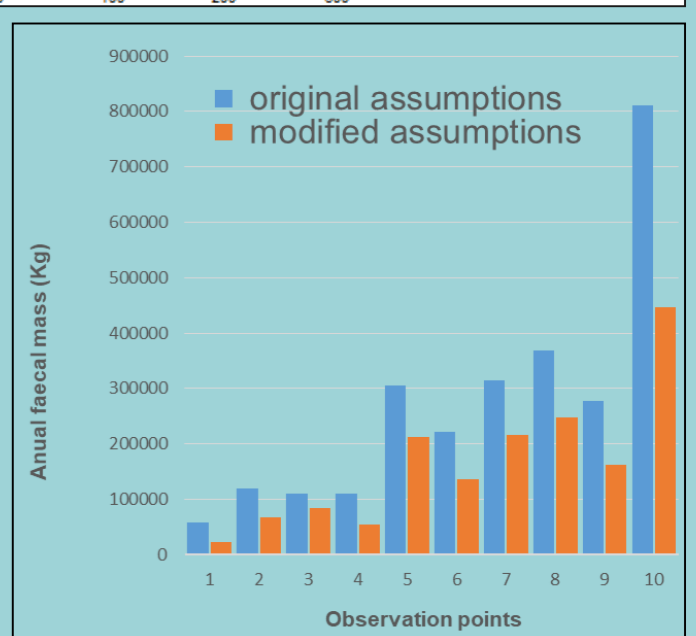


The map indicated faecal production at each building as well as the flow of faecal mass and the cumulative quantity travelled towards the prototype catchment's outlet via local drains.

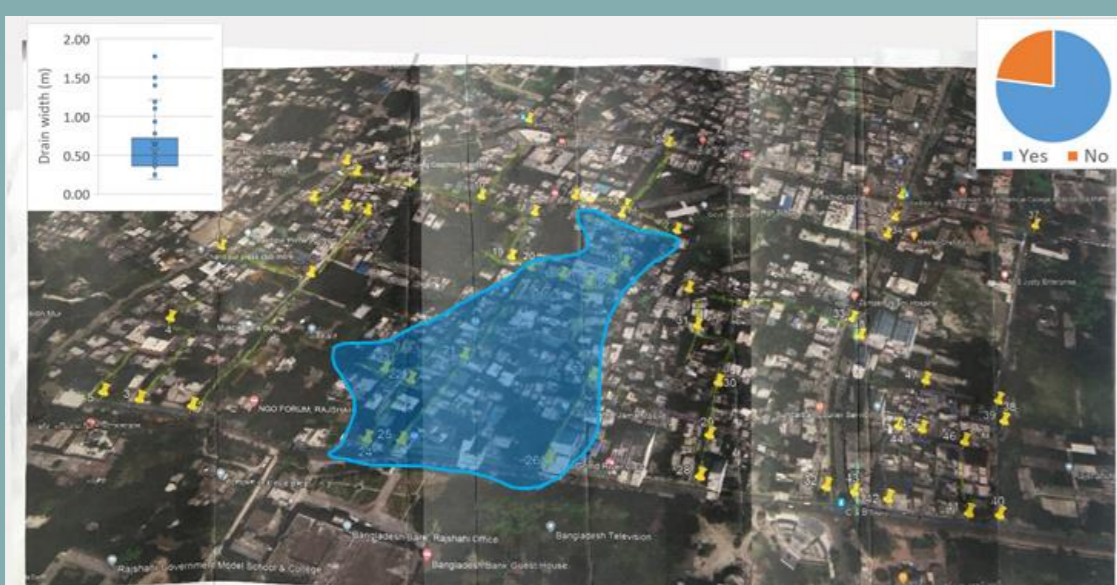
Spatial influence of Faecal Movement



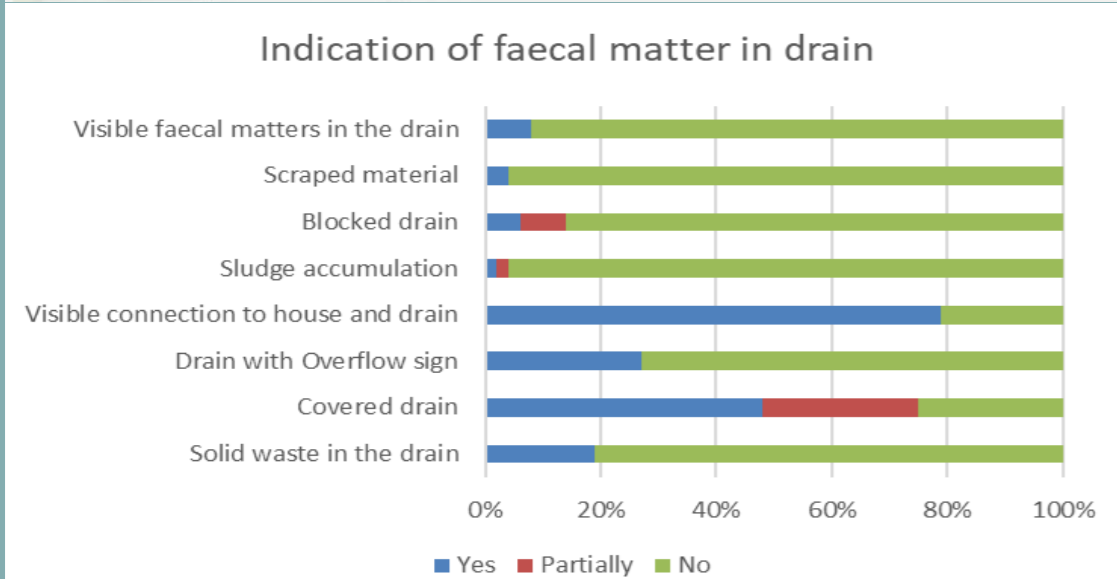
The difference in the models, original vs modified, when all five factors were combined, the modified model showed around 50% less faecal matter entering the drains.



4 Field Observations



- The comparison of the model output with field observations revealed an 80% consistency with the modelled flow direction.
- Around 80% of buildings have connection to drains. Also, the majority of drains are narrow (75% are <0.8 m)
- About 30% of drains show signs of faecal accumulation



5 Implication & Conclusion

- ✓ It is possible to produce a plausible map of faecal mass movement in a city using open source data and the novelty is the new way that these data have been combined within a GIS framework.
- ✓ This spatial representation of contextual understanding is critical for developing a better knowledge of the spatial sanitation situation in cities.
- ✓ The methodology will help guiding sanitation efforts to the areas of greatest need and prioritizing resources for sanitation maintenance. As well as reducing the overall cost and time of fieldwork.