WILL IT SCALE?

SIMULATION AND SCENARIO ANALYSIS OF

INFORMAL RECYCLING NETWORKS IN MUMBAI, INDIA

PROJECT NEED

- **In many countries, the informal recycling sector is a key player in the movement of recyclable materials from households/businesses to recycling processing centers**
- **Systems level:**
  - Lack of data on the informal recycling sector; collection businesses are often unregistered and/or do not keep open records of the quantities and types of material collected
  - Lack of knowledge on whether a **mandated decentralized system of material collection** (Material Recovery Facilities, or MRFs) would work better than the **current hierarchical system**, in which materials are sold up the value chain in increasingly large quantities
- **Individual level:**
  - Household collectors (**kabadiwalas**) suffer from lack of price stability, transparency between the seller and buyer on material prices, low profits, and lack of bargaining power with **wholesalers**
  - Unknown how the new system would affect kabadiwala collection rates

DIAGNOSIS

- Lack of data on the locations and collection abilities of key players in the system
  - Kabadiwalas (aggregators from households)
  - Wholesalers/Balers (aggregators from kabadiwalas)
- Lack of data on household populations at a ward or sub-ward level
- Primary challenge is how to evaluate a current system alongside a potential future scenario
- Municipal government spends the majority of its budget on waste collection, but misses this essential (and largely unseen and unaccounted-for) part of the value chain

ENGAGEMENT

- Using data on…
  - Locations of kabadiwalas and wholesalers
  - Base material quantities generated per household
  - Number of households per sub-ward census tract
- …I will evaluate the current informal system (kabadiwala to wholesaler) and compare it to the mandated future system (kabadiwala to MRF)
- This project will illustrate how the MRF system allows for a) greater economic profit for kabadiwalas, b) less distance traveled by all players in the system, and c) faster material recovery rates
- **Visualization of this system's performance can help us compare the outcomes of each policy at a systems and individual level**

FORM AND MEDIUM

- Web applet using p5.js that allows for public interaction to spread awareness of the informal recycling sector
- Within this applet, users will be able to increase or decrease the amounts of material generated per household, and see how this affects the performance of each scenario
- Users can view each scenario independently and run the simulations over one “week”, comparing each metric over this period and seeing the activity in “real-time”