drivers of change
waste

WASTE & BOOK/EXHIBITION & APP

Strengthen residents' driving force for waste management

drivers of change waste

Decreases Greenhouse Gas Emissions

The importance of waste management/recycling

380 gallons of oil

Recycle a ton of paper waste

savings of 17 trees

Reduces Air Pollution

7,000 gallons of water

rare earth element

Recycling one ton of aluminum waste uses 95% less energy than producing new aluminum

Recycling one ton of e-waste can reduce CO2 emissions by about 144 tons

Producing recycled plastics reduces water pollution by about 50 percent and air pollution by 70 percent compared to producing new plastics

Reduce 1.8 tons of Co2 emissions

Reduce landfill space by about 74 cubic metres

Raise public awareness of environmental protection

Electronic Waste Recycling

Tens of thousands of jobs

recycled plastic [1 ton]

Reduce oil consumption (1.9 ton)

Recycling 10,000 tonnes of plastic waste could create about 36 jobs

economic effect

Protect soil and water resources

*In 2018, recycled e-waste saved approximately 16.5 billion kilowatt-hours of energy, equivalent to the annual electricity consumption of 1.5 million American homes.

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Slender income

But

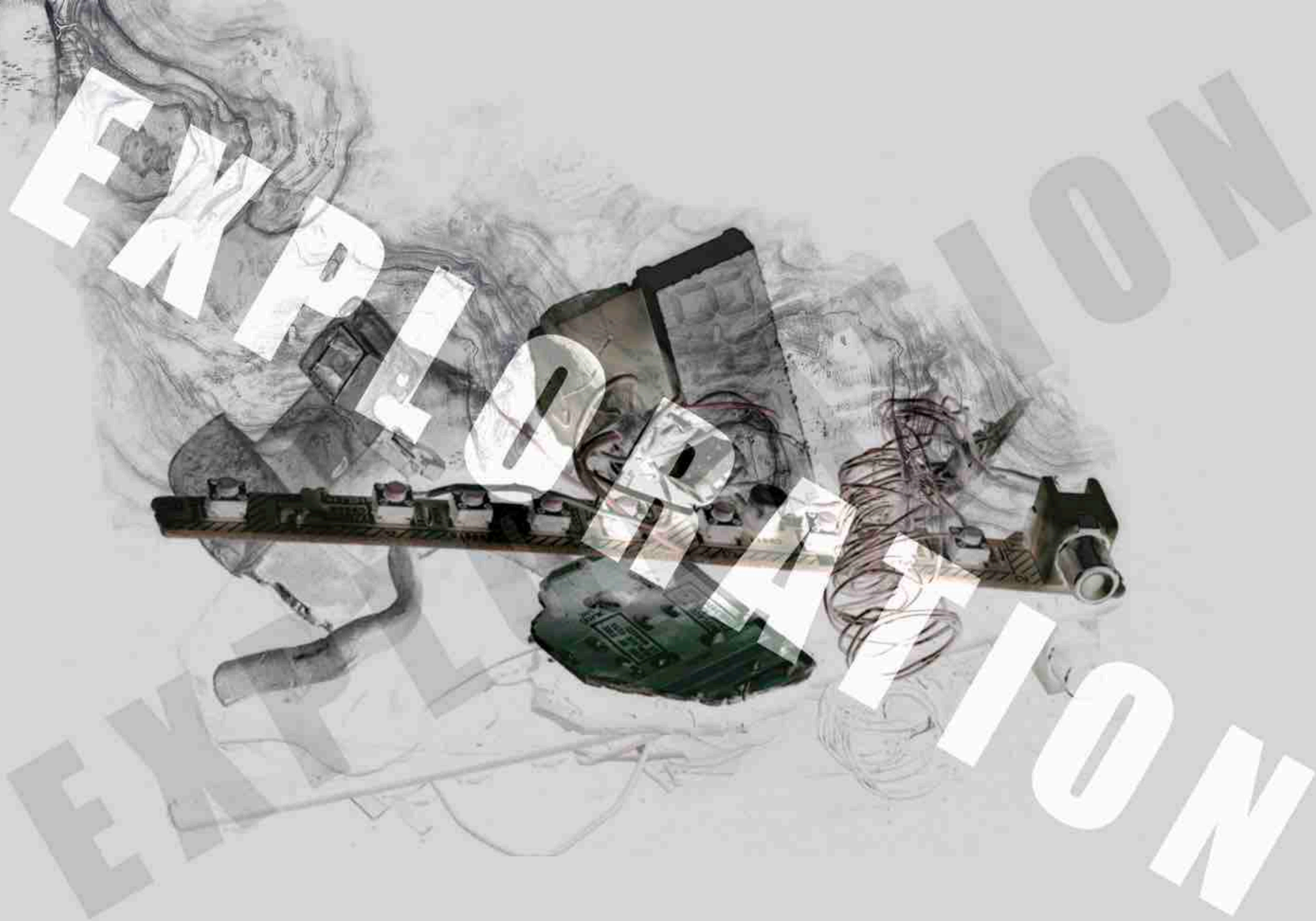
China's overall recycling rate is relatively low. According to some reports, the recycling rate of municipal solid waste in China is about 20%, while the recycling rate in some developed countries such as Germany and Sweden can reach more than 50%.

Activities in the informal waste sector (IWS) provide both immediate and indirect value to society whilst providing a livelihood for people unable to obtain work in the formal economy. Waste pickers can reduce municipal expenditures on waste management; urban externality costs are also reduced, as a result of the environmental benefits provided by waste picking (Fig 1). In Cairo, for example, more material is recovered in the informal (30%) than in the formal (13%) waste sector.

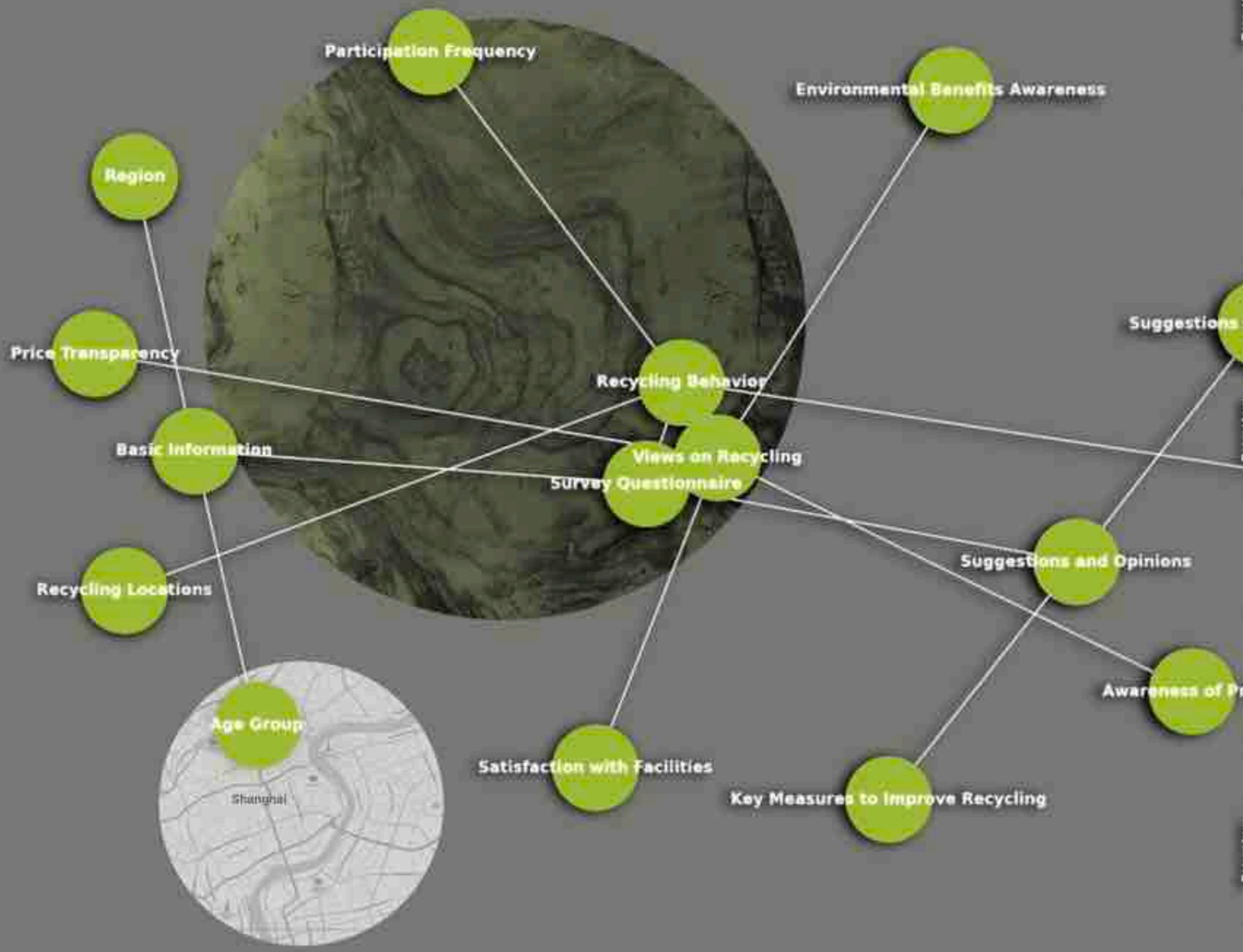
While cities as a whole benefit from improved general health due to informal collection activities, hazard exposure, unsafe procedures and lack of legal representation makes waste picking an often unhealthy and dangerous profession.

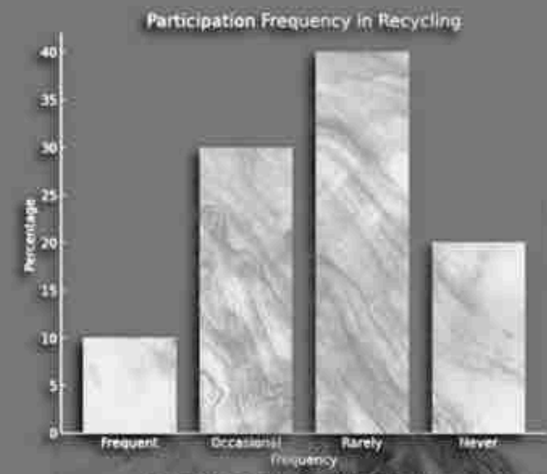
China estimates between 3 and 6 million people are involved in the IWS; in Latin America this number is estimated to be anywhere between 500,000 and 4 million people. By and large, IWS participants are among the most highly vulnerable groups in society, including recent migrants, children, retired individuals and disabled persons. Waste pickers occupy the lowest position in the hierarchy of the waste industry, providing crucial services but seeing little profit.

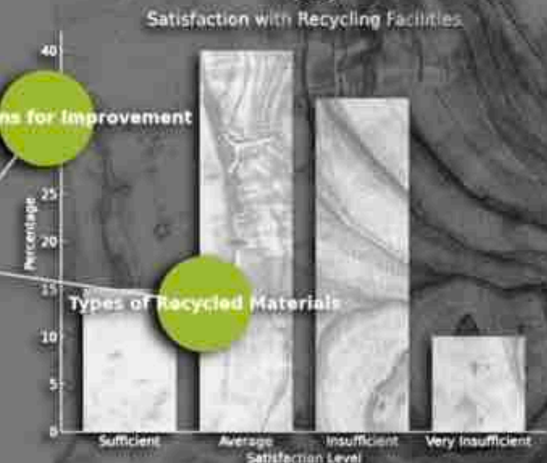
health implication

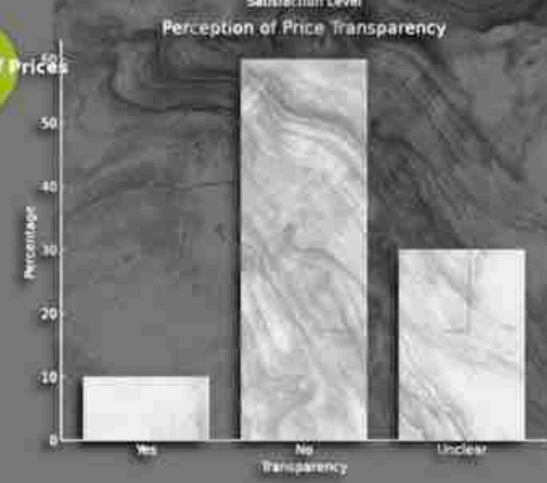

EXPLOSION

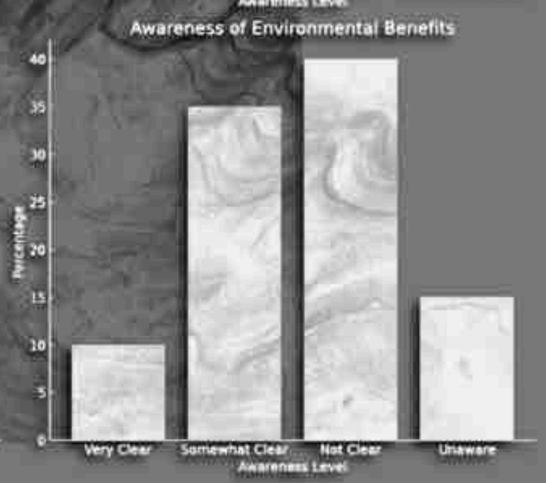
Online Research on Low Recycling Rates (Shanghai)











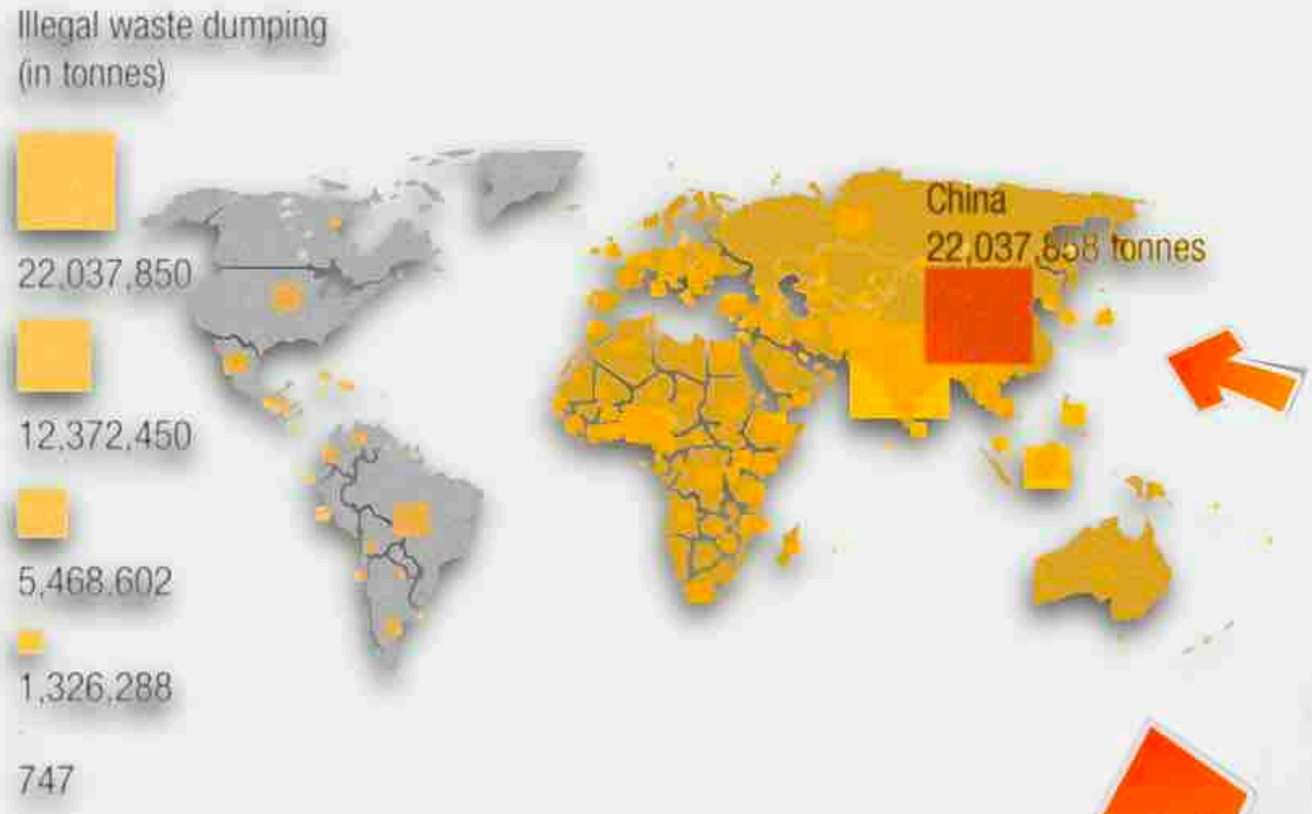
Main reasons for low recycling rate recovery rate (using Shanghai Nanjing East Road street community as an example)

Recycling stations are everywhere in Chinese neighbourhoods but do not function to pay residents (drop-offs).

Non-transparent waste recycling prices make residents hesitant to recycle, especially e-waste.

The nation's weak environmental awareness makes it difficult to separate waste, which can only be sorted by staff exposed to the hazards of electronics for long periods of time.

INVESTIGATION RESULT



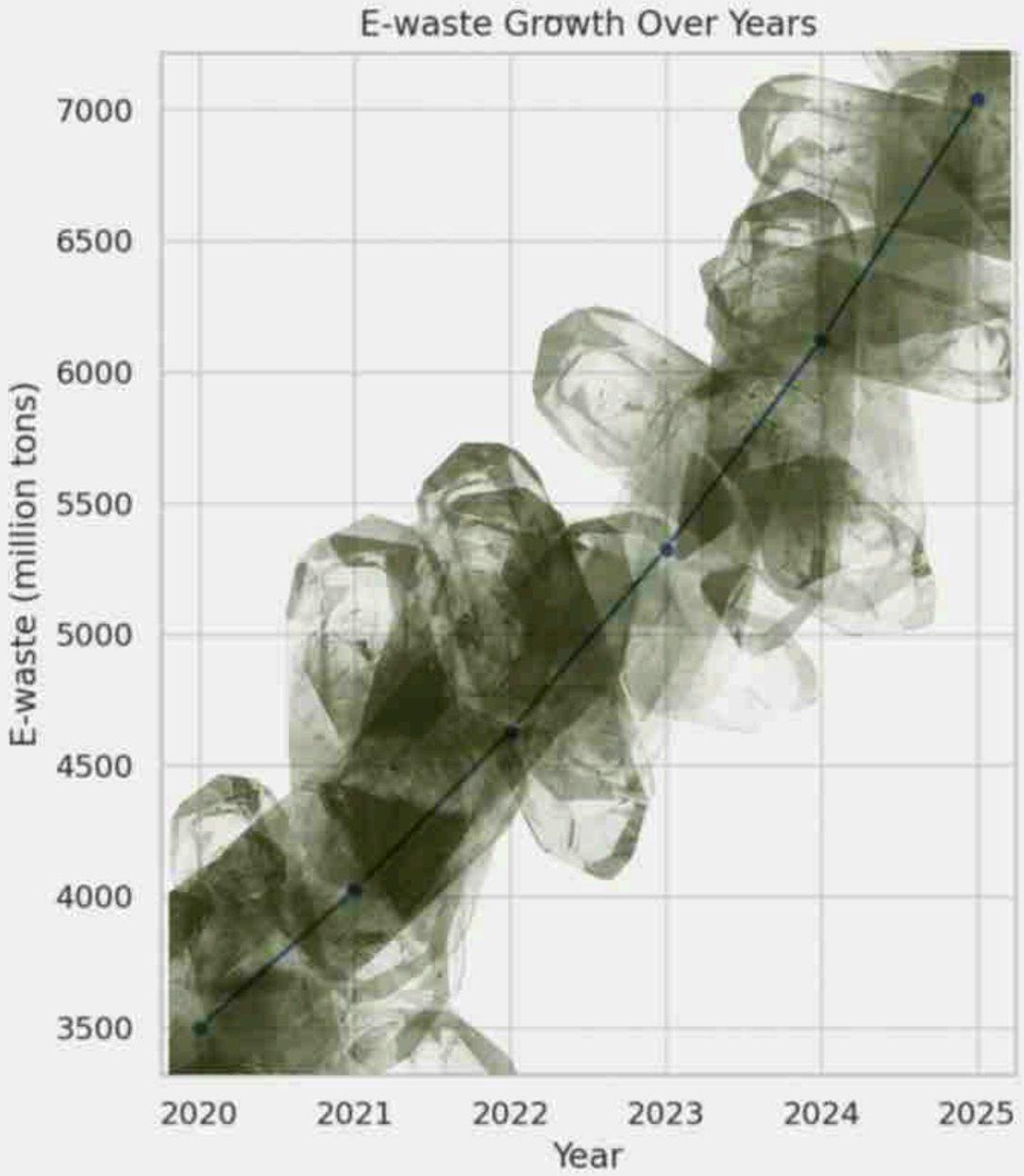
Global illegal waste dumping by country
[Let's Do It Foundation, 2016]

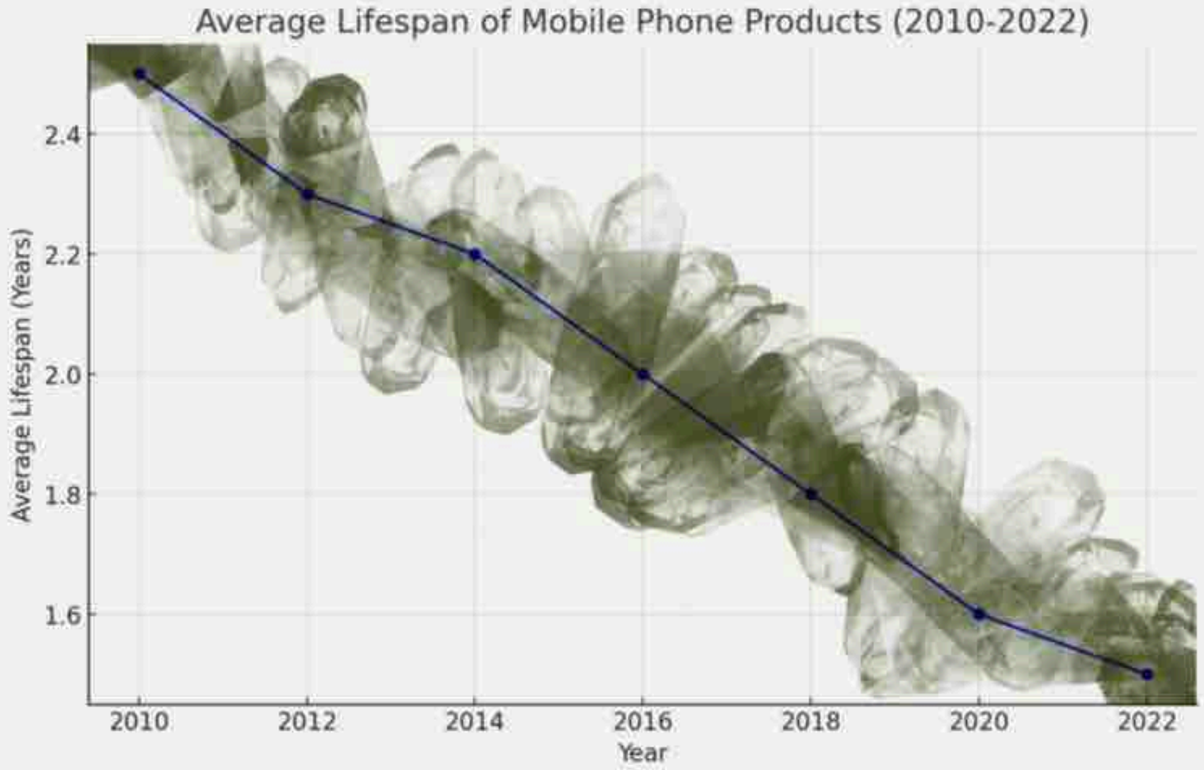
Lack of economic incentives:
The majority of residents (60%) believe that increasing economic incentives is the key to increasing waste recycling rates and that there is a lack of direct economic reward for current recycling behaviour.

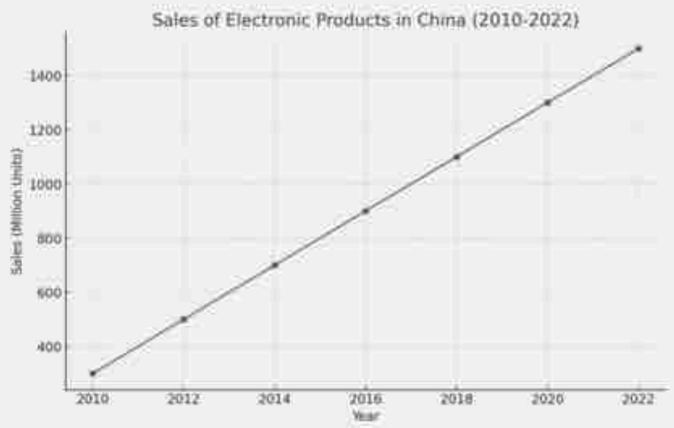
lack of price transparency:
The majority of respondents (60%) felt that the price of waste recycling was not transparent, leading to residents' distrust of the recycling system, and 50% of respondents did not know the price of waste.

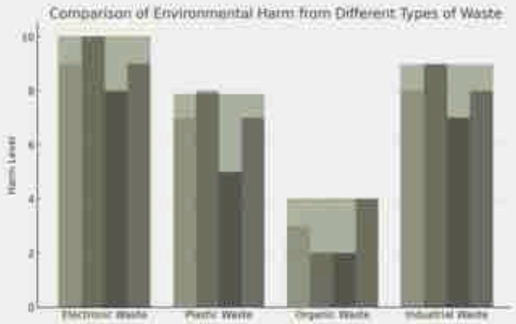
Insufficient public awareness of environmental protection:
Only 10 per cent of respondents were very clear about the environmental benefits of waste recycling, while 40 per cent said they were not very clear or did not know anything about it at all, indicating the need for more environmental education.

STARTING POINT: E-WASTE









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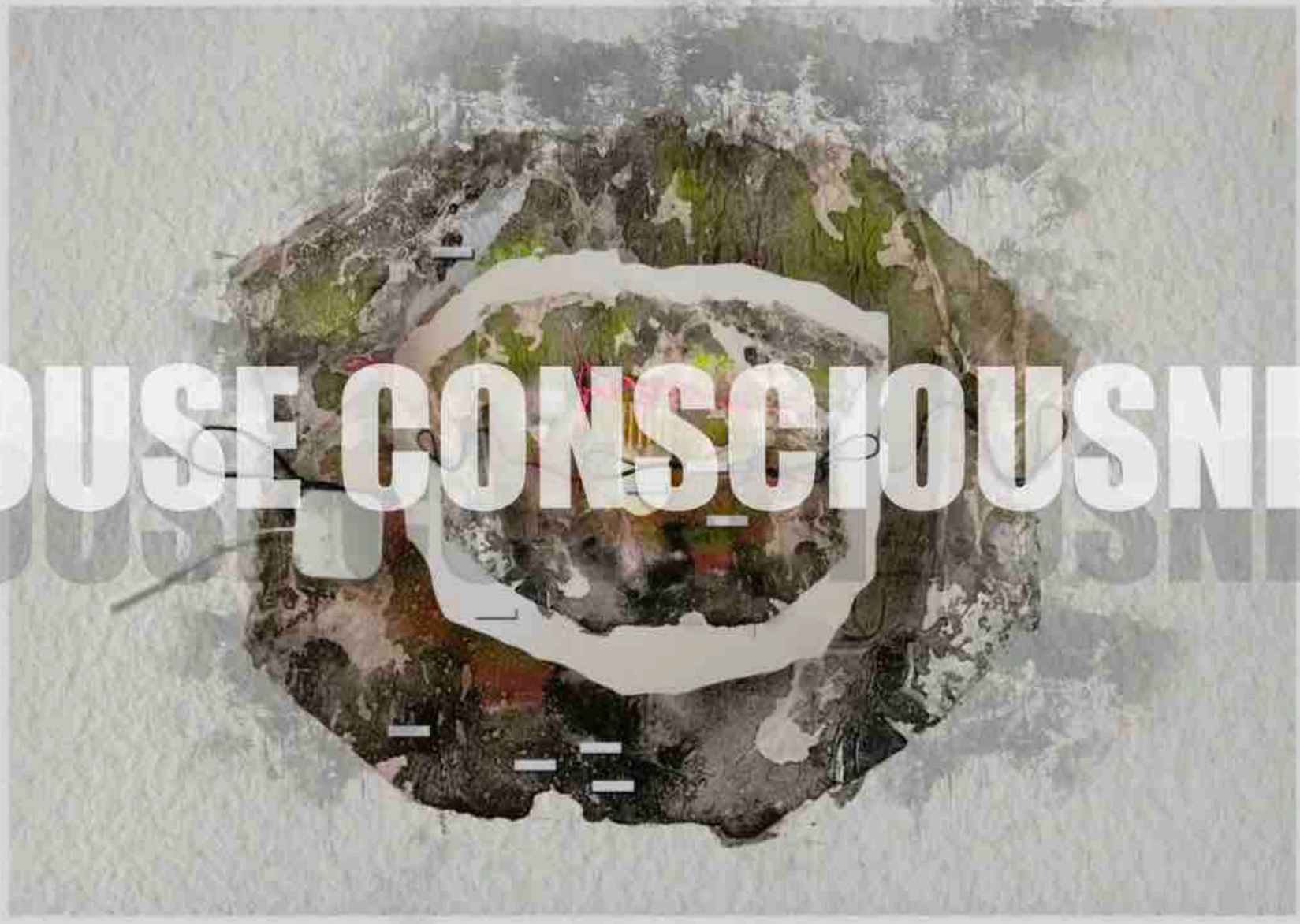

AROUSE CONSCIOUSNESS

VISUAL EXPERIMENT

Junhan Zhang

"THE DANGERS OF E-WASTE"

electronic waste

Electronic waste consists of discarded electrical and electronic equipment (EEE). As computers and mobile devices have become an essential part of daily life in industrialised countries, EEE increasingly constitutes a significant percentage of the global waste stream; small devices, with their frequent replacement cycles, make up the largest share (Fig 1).

In EU countries, 9.45 million tonnes of e-waste was generated in 2012; only 35% of this figure was officially reported, collected and recycled. The remaining 65% was exported (1.5m tonnes), recycled locally under non-compliant conditions (3m tonnes), scavenged for parts, or simply added to the general waste stream.

Production and disposal of EEE carry significant long-term social, health and environmental consequences for developing countries, making the EEE value chain a critical subject for future international regulations. Although the 1989 Basel Convention restricts export of e-waste, an estimated 70% of global e-waste is disposed of in China (Fig 2) with the remainder spread across India and Africa, with little to no recycling regulation or oversight.

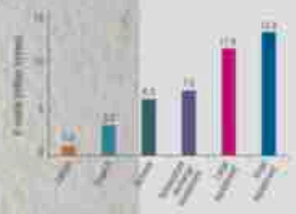

Fig 1: Total e-waste per category
(United Nations University, 2014)

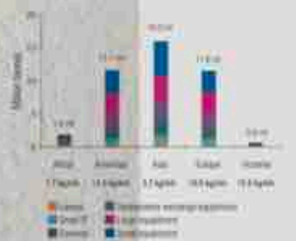

Fig 2: Total e-waste generation per category and continent
(United Nations University, 2014)

Various forms of publicity materials to achieve the purpose of raising residents' environmental awareness

02

ESTABLISH A COMMUNICATION

Residents
Scrap collectors
Recycling Stations
Businesses that recycle them
Donated

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"Recycling Wizard" app

Common Functions

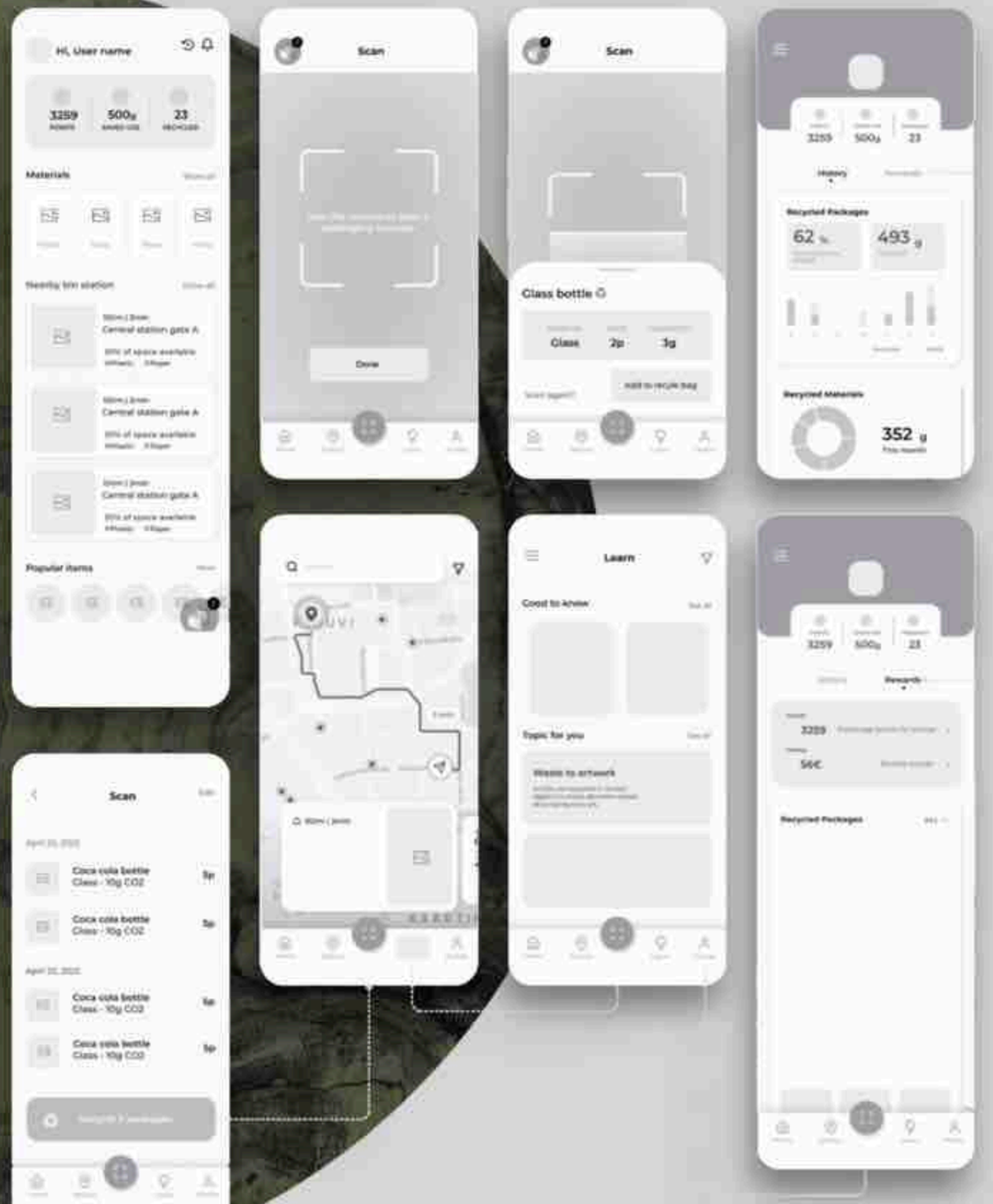
USP

- Make an appointment for door-to-door collection
- Open and transparent recycling prices
- View waste streams and transformations
- Placement for the Waste Pickers Group (IWS)
- Redeeming Points

"Recycling Wizard" app

Prototype 1

Prototype 2



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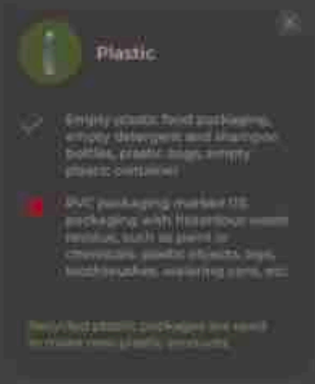
High fidelity (main feature)

Materials Detail

Material categories to check details of which items are recyclable and not. This is more efficient as repeat users are already able to determine the material an item is made of.



Activity Overview

User can easily see their points, CO2 they saved and total package they've recycled.

Nearby Bin Station

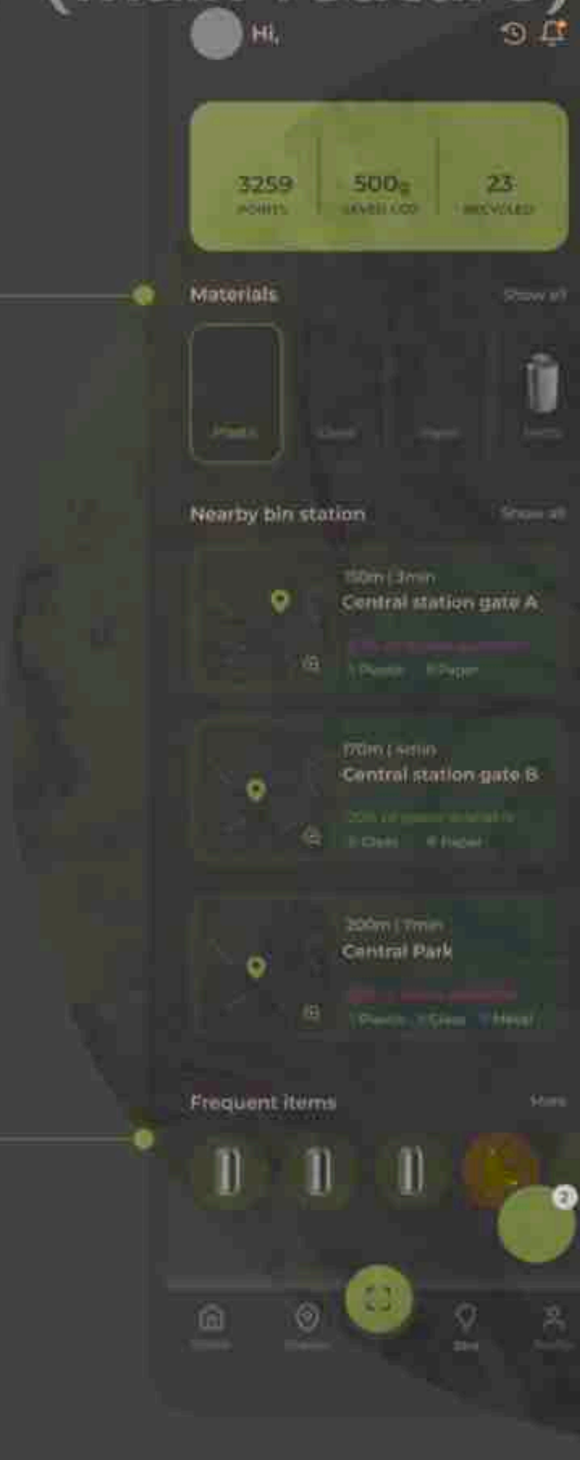
Nearby bin stations appear on the home screen to help users reach their goal faster.

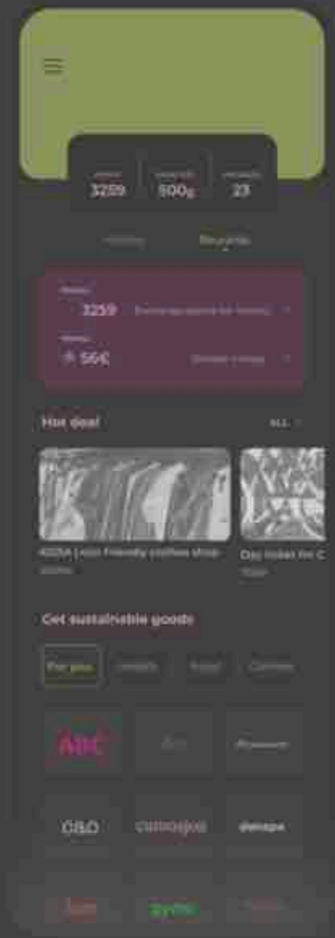
Frequent Items

Frequent items help users to know which items are recyclable and make it easier to recycle them again.

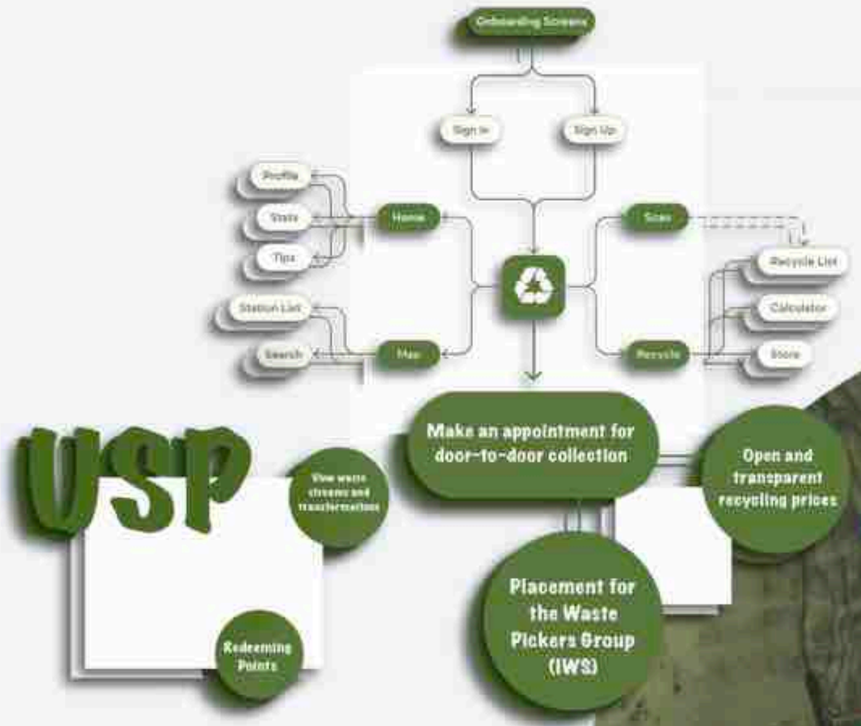
Recycle bag

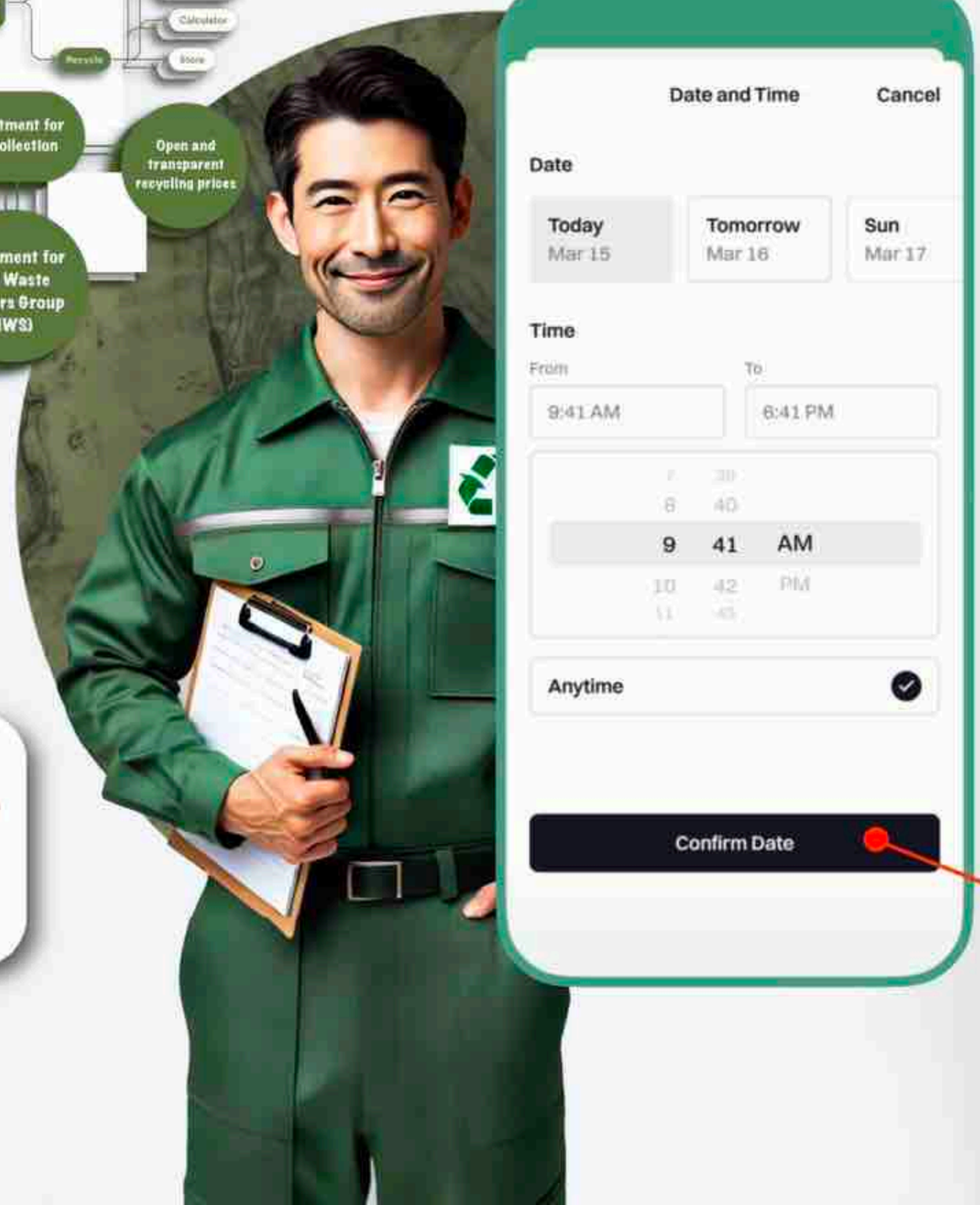
Items picked by scanning, are placed in a recycling bag and remain there until they are recycled together.





Make an appointment for on-site recycling services to help scavengers complete their career transition





Promote recycling applications through integrated material art works

Prototype 1

Frequent Items

Frequent items help users to know which items are recyclable and make it easier to recycle them again.

Prototype 2

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