The Alchemy of Green Markets: Materiality, ethics, and value transformations in Delhi's e-waste recycling industry

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Abstract

Drawing on a year-long fieldwork in Delhi's e-waste sector, my thesis follows the struggles to formalise e-waste recycling in India. I approached the issue of responsible e-waste recycling by exploring the after-effects of the 2016 E-waste (Management) Rules that introduced the principle of Extended Producer Responsibility (EPR). The rules defined the responsibility of electronics producers, recyclers, and retailers in terms of targets, and made provisions for compliance and the fulfilment of EPR through third party Producer Responsibility Organisations (PRO). During my fieldwork, I worked closely with one such for-profit PRO that I call Sahih Kaam, which strives to provide services up to the highest environmental standards. Sahih Kaam goes beyond compliance with government regulations and aims to change the way in which e-waste recycling works in India. The company works to implement the EPR policy tool, which introduced the principle of competition and market into responsible recycling, to replace the infamous informal market and its harmful and unsanitary practices. The thesis traces the effects of the policy tool as it is put into practice in search of the right, environmentally responsible, and sustainable way to recycle. The thesis foregrounds the PRO's struggles to even out the contradictions engendered by the ethics of responsibility and an already saturated social landscape that patterns e-waste recycling in India.

I begin my exploration of e-waste's value transformations between informal and formal recovery channels by examining the pricing of e-waste, its materiality, and the way obsolete electronics break apart in the process of market exchange. I show how market exchange produces negative value through the release of toxic substances and reinforces the need for market intervention in the name of responsibility. In the absence of effective state regulation, the PRO strives to contain this negative value through "material arrangements of honesty" that is required for transparency, traceability, and auditability. Then, I examine how the PRO and scrap dealers come together to establish responsible recycling practices – an endeavour that requires cooperation between people with distinct worldviews and ethical goals. Informal scrap dealers and the PRO produce unexpected alliances for environmentally sustainable practices. The work also focuses on the complex knowledge practices involved in navigating the market, as traders seek to acquire, possess, and hide specific market dynamics. Ultimately, my ethnographic focus on the exchange relationship between the PRO and scrap dealers brings an emergent waste infrastructure into view. The thesis shows how the promise and challenge of the enterprise of formalising e-waste recycling for the PRO lies in overcoming the incommensurability of environmental ethics and economic growth. This work of commensuration effects a series of value transformations to make waste into a new productive frontier of green capitalism.

Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning

Copyright statement

Dedication

To Uncle Gyuri

Author's note

All names in this thesis are pseudonyms except where the identities of public figures are crucial for historical accuracy. In some cases, I merged identities to make the narratives easier to follow as well as to preserve informant's anonymity.

All translations from Hindi to English are mine. In my transliteration of Hindi rendered in the latin alphabet does not follow scholarly conventions of using diacritical marks. Rather I chose to follow the more everyday conventions of Hinglish, which is becoming standardised through the widespread use of mobile phones and text prediction. This is the form of written language that I have become comfortable with to communicate by text with friends in India over the years.

Prices have been provided in rupees. The average exchange rate in 2019 was INR 100 to 1.11 pounds.

I had not provided any pictures for I find the framing of the wastelands of e-waste processing sites problematic. My article "Where is toxicity located? Side glances through fieldwork in a toxic place" published in 2021 in Anthropology Today explored this topic and included some of my fieldwork pictures.

Glossary

auto – short for autoriksha, a three-wheeler for hire

challu – working order

CPCB – Central Pollution Control Board

CPU – central processing unit

EPR – Extended Producer Responsibility

godam – godown, warehouse

kabad – scrap

kabadiwalla – scrap dealer

kabade ka dukaan – scrap shop

kachra – waste no one wants

khatta – open space for the open market

maal – load, stuff, wares

kagaz ka kaam – paper trading

PCB – printed circuit board

pheri-phere Maliks – hawker Maliks

PRO – Producer Responsibility Organisation

riksha – a bicycle fitted with three wheels and space at the back for loads

SMPS – Switched Mode Power Supply

SPCB – State Pollution Control Board

Main characters

SAHIH KAAM

SATKAR – founder of Sahih Kaam

ANJALI – mid-management responsible for outreach and awareness team

AMIT – logistics guy, responsible for "onboarding"

MR KAKKAR – new in mid management, driving prices down

SATISHJI – first enrolment of aggregators

BHAVEEKA – business development team

LATA – outreach and awareness team

VARUN – jack of all trades, including being my research assistant

SANTOSH – logistics guy

DIPESH – awareness team

DAREDEVIL – business development

NAVITA – producer accounts

MANISH – linking aggregators and company

KARTIK – quality control, based in the warehouse

KABADABAD

MOHSIN – eldest brother, runs a dismantling plant

MAHIR – middle brother, finishing law school

MAHMOOD – deals in CPUs, Sahih Kaam aggregator

SHAHEED – CD-ROM dismantler, Sahih Kaam aggregator

SAMIR – Shaheed's brother, dismantler

ANAS – dismantles TVs for their transformers

JALEEL – trades in keyboards

HASSAN – fellow Sahih Kaam aggregator

SARPHOO – Shaheed's partner for a keyboard trade

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Just like the work of my interlocutors, my labour consisted of picking through scraps of information and trying to reframe them in a way that it shines. This thesis has been long in the making, accruing quantity and quality along the way in search of gold. For all the aggregation and marginal gains, I have others to thank.

First and foremost, I thank the man I call in this thesis Satkar, and his employees at Sahih Kaam, for opening up to me, and letting me in. I am particularly grateful to the one who became my research assistant. I also thank the numerous Maliks and the few non-Maliks in Kabadabad, who made me part of their lives, fed me, clothed me, spent time with me. I especially thank Shama and Aslam for their intimate friendship. Shalu and the Khan family made me feel like home. I could always count on them for a glass of water or a plate of daal when my local kitchen skills failed.

I thank most warmly my main supervisor, Penny Harvey, for taking responsibility for me and for my project and for guiding us through to completion with a firm hand. I am also much obliged to my second supervisor Soumhya Venkatesan for being there at crucial times to orient me in the right direction by a well-placed advice or a sharp comment.

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Ahmad Moradi and Annastiina Kallius have been long-term intellectual companions, leading the way to and through anthropology. There is no way to appraise and quantify the hours, days, months, years (now adding up to over a decade) spent in dialogue.

Ahmad and Manchester gave me the best pen pal ever, Letizia Bonanno, who is always available for a chat about anything, no matter how small or large a matter. Our daily Facebook chats will one day become an important document of the times (unless they are forever lost in ether).

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Anand's mentorship was the most formative and he the bane of my existence. Thank you for insisiting that I should write well. I try and fail every day. I hope this time I failed better.

I thank my family, my siblings Jankó, Aliz, Jakab, and Léna, and my mother Kinga. It's great to be a big messy, quarreling, happy family. Even if it happens only once a year.

Without my father Istvan Perczel I would probably have never even finished elementary school. Worse still, I would have never learned to multiply or write a single word in any language. He dragged me to India in the first place and his long unpaid hours of copy-editing have made this thesis intelligible. Thus, I owe him everything.

I am very grateful for my two examiners: Julia Elyachar and Jolynna Sinannan whose questions pushed me in the right direction.

For all the remaining faults and chips through which the seams become visible I have only myself to blame.

"Commodities cannot themselves go to market and perform exchanges in their own right. We must, therefore, have recourse to their guardians, who are the possessors of commodities. Commodities are things, and therefore lack the power to resist man. If they are unwilling, he can use force; in other words, he can take possession of them." (Marx 1982, 178)

Introduction: when did environmentalism become a business?

It is 3 April 2019. The Delhi heat is not yet in full swing, though it already has a bite. It will take another couple of months for the sweltering heat to reach unbearable proportions at the all-time high of 48 degrees. None of that reaches us in the dark, heavily curtained, and air-conditioned event hall on the top floor of the Taj Mansingh Hotel. The plush hotel is located in the middle of Lutyens's Delhi, a well-ordered, quiet, and leafy part in the centre of the now sprawling metropolis, built in the early twentieth century by the British when relocating their capital from Calcutta. It is an unlikely space for a day-long event on the way forward in e-waste recycling, a topic usually associated with dingy warehouses and toxic smoke in the city's peri-urban markets. And yet, there is nothing extraordinary about the fancy surrounding becoming the venue for the demonstration of investment potential in the industry. After all, it is in these spaces that businessmen with money, policymakers with laws, and a young startup with ideas can come together and deliberate on the future of e-waste recycling.

The day began with the performance by a group of school children in the tradition of Hindi street theatre, in which they impersonated irresponsible consumers and different items of electronic discards. The school had won the best school award for the performance from Sahih Kaam's[1] awareness team and the prize included the chance to present it again in front of the illustrious audience. The students were among the 20,000 engaged in the past one year by Sahih Kaam, the producer responsibility organisation (PRO) that was in the spotlight of the event for its success in "formalising" e-waste recycling and proving the potential for an investment in e-waste. The event doubled up as a closing celebration of the partnership between Sahih Kaam and Transregional Finance Association (TFA), an international organisation focused on financing development projects. The year-long cooperation meant working together in communications and sharing

[1] All names are pseudonyms. Sahih Kaam means "right kind of work" in Hindi, and I am using this name to indicate the role the company fulfils in my narrative. The pseudonym draws attention to Sahih Kaam's striving to work according to environmental ideals and ethical practices, which reveal the shortcomings and failure of the legal regime of responsible e-waste recycling. I have also changed the names of international organisations and the electronics producer brands with whom Sahih Kaam works, to avoid any possible identification of any of the actors or the kind of business relationships that they have, to avoid jeopardising the fragile system that has been in the making, while I hope that my narrative might highlight the shortcomings and provide a basis for redesigning laws and processes.

experiences and metrics of success, such as the number of students reached and the amount of waste collected. As the year came to a close, the partnership was crowned by a programme that saw seated at one table a diverse range of industry actors, government officials, environmental advocates, consultants, international organisations, and the lone PRO. Although the event was a closing ceremony, the success was also an occasion to celebrate potential in the future.

I had been with the startup for over three months and understood the importance they placed both on their partnership with the international partner organisation and their awareness-raising activities in schools, for which they designed a school curriculum. I got to know about Sahih Kaam around the time it was being set up in 2017. Having expressed an interest, I was first advised that the 'ecosystem' was too young and too much in the process of development to provide any valuable conclusions for a study. Yet, the sense of newness and the promise of studying an emerging waste infrastructure as a space for experimentation (Harvey 2017) drew me in. Harvey et al. (2017) point out that since "infrastructures are shaped by multiple agents with competing interests and capacities" (10), infrastructural development is always "the result of an unfolding, experimental process" (12). By the time of my fieldwork in 2019, as the event also demonstrated, Sahih Kaam had achieved a great deal in setting up collection channels, developing a producer clientèle, and working out an awareness programme in schools; but also with bulk consumers and resident's welfare associations (RWAs). I was motivated to study Sahih Kaam's activities; to learn about how what counted as an 'environmentally responsible' approach was worked out in practice.

It was going to be a "*matlabwala* [meaningful] event" and not a "seat *bharnewala* [filling]" event as the startup founder Satkar made clear at the time of planning. A key aim was to make sure that there was someone representing the views of each body of stakeholders. Thus, the following account of who was present and what they said delineates how Sahih Kaam understood the e-waste ecosystem in which they were functioning.

After the school children, Thomas Lindhqvist,[2] affectionately introduced as "the father of EPR", took to the stage. "The father of EPR" is an origin story by himself, since he is the originator of Extended Producer Responsibility, the policy tool that is gaining ground across the world as the framework to manage e-waste. He also has a tendency, in his presentations, to take his listeners back in time and start from how waste has become a problem. Thomas, always referred to by his first name or his epithet in Indian waste management circles, was the most esteemed guest at the

[2] I do not anonymise Thomas Lindhqvist and the NGOs because they have been historically important to the development of the terms of the debate around e-waste both in India and abroad.

event, where a diverse crowd of government officials, non-governmental organisations, consultants as well as representatives of consumer brands had turned out to receive his wisdom.

Thomas began from the time before there was any problem with wastes since what humans did not eat would be given to animals and the remainder broke down "in the natural way." The problem of waste started with big cities and humans becoming "clever" in creating artificial things, turning raw materials into products, which in turn helped more extraction. Yet, cleverness did not extend to being able to deal with all the new substances created. He ended on a more hopeful note: we have to be clever, it is going to take some time.

For Thomas, being clever meant coming up with the policy tool of EPR in the 1990s. He presented the period as the time when the need to change sank in, when it was no longer enough to target big industries and their manufacturing emissions. There was a need for policies to target what was happening to products after consumption. Then, he gently reminded the room not to be triumphant, for this was an ongoing struggle and a continued challenge for industrialists and governments equally, but more so for the latter. In fact, a vigilant government was essential for the success of EPR.

There were multiple interests bound up in the event and the two organising teams did not always see eye to eye. The cleavages became even more pronounced as the event progressed. Since the local office of the international partner was the main organiser, it set the tone by foregrounding the urgency to demonstrate that there is a great investment potential in e-waste and that Sahih Kaam's performance was the proof for this. Sahih Kaam's hope for Thomas's role alongside producer brand representatives and government officials was that the latter would perhaps listen to the former about the need for enforcement. The E-waste (Management) Rules of 2016 were only the first step in bringing e-waste recycling under government control, but further steps need to be taken to make sure that materials are recycled and made to feed back into production. However, Thomas went further to also warn against looking too closely to Sweden and the European model and expect that a shift will simply happen on its own in India. The main difference, he highlighted, is that Swedes and citizens in Europe pay for their waste to be processed, a practice that would cause governments to fold in India where people are used to receiving money for their waste. Therefore—again a jab at government—there has to be willingness to enforce regulations despite the lack of popularity and find alternative sources for funding waste management. EPR has the potential to create a market but that requires a strong and vigilant government willing to enforce rules.

What is the right way to recycle?

Although the event hall of the Taj Mansingh hotel may be an unlikely place to start an ethnography about e-waste, I have a very good reason for not starting from the peripheral parts of Delhi as the space of scrap and rubbish. Events and meetings in the heart of Delhi have been central to what happens with e-waste in India. Therefore, it is important to understand these disparate, unconnected spaces relationally. Corporate players and non-governmental organisations have played key roles in setting up the terms of the debate on e-waste. Thomas set off a global trend of rolling out EPR rules; today 71 percent of the global population across 78 countries are covered by some form of e-waste legislation, most based on principles of EPR (Forti et al. 2020). Though there are a great variety of ways in which the policy tool has been implemented in different countries, across different continents and the income divide (OECD 2016). The result in India has been setting up environmentally responsible markets. But the issue did not start there.

E-waste arose as an environmental concern in the end of the 1990s, culminating in the publication of the first globally significant reports by the Basel Action Network and Toxics Link (BAN 2002; Toxics Link 2003.) The focus of those reports was that despite the continuing acceleration of electronics consumption and increasing rates of obsolescence in the US and the EU, collection and recycling rates remained low in the official channels. Rather waste electronics were shipped overseas, where their content of highly toxic chemicals and heavy metals turned e-waste recycling hubs in India and China into hellish landscapes of environmental degradation. The reports about Delhi's e-waste markets became the foundation for the concern for the e-waste crisis in the past two decades. Reporting became increasingly focused on the growing quantities of waste, "a tsunami of e-waste was heading our way," read the headlines (UN 2015). "E-waste is the fastest growing waste stream" became the most cited expression used to justify attention to the issue. In the mid-2010s, calculations became more precise: "In 2016, 44.7 million metric tonnes of e-waste were generated. This is an equivalent of almost 4,500 Eiffel towers," announced first Global E-waste Monitor (Baldé et al. 2017). By that time, the quantification of e-waste growth was no longer just a call to environmental action but was coupled with the concern of wasted valuable secondary raw materials and the speculation that a circular economy would lead to "huge economic and employment opportunities … the presented 55 billion Euros of secondary materials is an underestimate of those economic opportunities" (Baldé et al. 2017).

While in the initial phases the argument revolved around environmental justice, and the concern over 'dumping' e-waste in Asia, the terms of the debate shifted to the recovery of value in place. There was simply too much valuable resource wasted, the argument went, especially that previous

'dumping' destinations were now joining the list of the most significant electronics consumer countries. In 2019, India was the fourth largest producer of e-waste. Rather than focusing on the downsides, it was highlighted that e-waste contained more concentrated copper and gold than virgin ore (Zeng et al. 2018). Despite the potential pent up in the numbers, the barrier to realising these economic goals was that documented collections remained disappointingly low the world over. The global average of documented e-waste collections remains around 20 percent, with only the EU faring better at collecting 38 percent of their e-waste produced and Asia collecting at a dismal 15 percent in 2016 (Baldé et al. 2017).[3] Where does the rest go?

The assumption is that the rest of e-waste is dumped and processed by the informal sector without appropriate technology and protective equipment, causing significant environmental damage. Consequently, geographers have shown that global flows of e-waste were more complex than the assumed relations of dumping (Lepawsky and Mcnabb 2010; Lepawsky 2018). Another line of argument to nuance the environmental advocacy narratives was to draw attention to the various ways of creating value out of e-waste, including second-hand sale and refurbishing, which slow down planned obsolescence (Lepawsky and Billah 2011; Corwin 2018b; Wong 2022). Yet, these counters to the policy narrative produced the informal sector as the main site of social science enquiry. I found little answer to the question of what would count as proper and official e-waste recycling. Moreover, was there an environmentally responsible solution that did not rely on shipping fractions that could not be recycled profitably to countries with no environmental rules or lax enforcement and cheap labour? If there were no such solutions, then, what was being done to create one? What counted as "environmentally responsible," and how would it be worked out in practice?

India's recently introduced legislation provided a good framework, through which to explore the question of the environmentally responsible, correct way of recycling. After the reports in the early 2000s created a global outrage and spawned innumerable reports and documentaries about the dark side of growing electronics consumption, a collection of civil society actors campaigned to push the government to pass e-waste legislation. Toxics Link, the advocacy group that first documented informal e-waste markets in Delhi, worked together with the local office of GIZ (the

[3] "The Global E-waste Monitor" (Forti et al. 2020) has been publishing regular updates on these figures. In the most recent edition, the global e-waste production stood at 53.6 MT of e-waste with a yearly increase of 2.5 million metric tonnes. The report provides the breakdown of total production by continents, in which Asia, given its size, leads with 24.9 MT, although it only generates 5.6 kgs per capita per year in comparison to Europeans who produce 16.2 per capita. Around the year 2016, India's place as the fourth largest e-waste producing country in the world after US, China and Japan made headlines (*The Hindu* 2016). Around the time of my fieldwork, Sahih Kaam operated with the social fact that India was the fourth largest producer of e-waste, repeated so many times that it became a reality. However, I was not able to find any credible source for this calculation.

German development agency) to prepare the draft of the law that would introduce the "polluter pays" principle through EPR. The idea to make producers responsible was first introduced in the E-waste (Management and Handling) Rules of 2011. The 2011 Rules already advanced the most relevant concepts, identifying the responsibility of each actor: producers, individual and bulk consumers, recyclers, dismantlers, refurbishers, and repair shops as well as the need to channel e-waste away from the informal sector to registered and "scientific" recycling facilities (Agarwal and Mullick 2014). Seeing that this initial law did not effect significant changes, advocates, NGOs workers, and interested government officials continued to press for an update. This pressure resulted in the E-waste (Management) Rules of 2016. The updated legislation specified responsibility in terms of mandatory targets for e-waste collection and introduced a new actor called the PRO (Producer Responsibility Organisation). The E-waste Rules thus apportioned the responsibility of each stakeholder, creating a map for the e-waste ecosystem, and mechanisms to extract the funds required for recycling from producers. The PRO was a collective solution offered to producer brands in the form of a company specialised in compliance, and in collecting the e-waste to fulfil the targets. Thus, Sahih Kaam, a newly founded PRO, provided the perfect ethnographic case study through which to study what it meant to set up new collection channels for a new market in responsible e-waste recycling.

The e-waste ecosystem

The central question of who pays for the treatment of waste drives EPR, and the new market in responsible recycling is supposed to make the recycling profitable. The responsibility lies with everyone. As Sahih Kaam's demonstration of their school campaign highlights, it must start with school children, making them aware of the ills of inappropriate e-waste recycling. Hopefully—but the system doesn't rest on this shaky hope from Thomas—everyone has been taught by their parents that taking responsibility is a good thing, and no one, including producer brands and governments, will say: "No, I don't want to be responsible."

Despite the radical move towards responsibilising producers to push them to create better recyclable products from the design stage, as Thomas explained, the whole endeavour comes down to the consumer. "It is the citizens of a country; they are always paying; it is just a question of how you pay." Given the political repercussions of collecting money directly from the people, EPR was designed with the intention to find other sources of funding. The policy tool identified the producer as the most convenient point at which money could be extracted for the purpose of footing the bill for recycling. "We have nothing against producer brands," he said, "it just so happens that it's easiest to collect the money at that point in the value chain. It's simply that

producers have possibilities that few other actors have. E-waste is a different issue from other forms of waste," Thomas argued, "since the material itself is quite valuable." Thomas's reasoning brought together a few widely prevalent environmental facts and assumptions: that e-waste is hazardous but also valuable (Kama 2015); that people must be responsibilitised to do the right thing; and that their responsibility could be expressed through paying a fee. Who would pay the fee would be the next question. For Thomas who conceived of EPR in the Sweedish and European context the answer is evident, it is always the consumers who pay but the fee is extracted at the point of producers through assigning legal responsibility. The emphasis, however, is on e-waste's valuable materiality, which sets it apart from other forms of waste.

There are multiple issues at play here, which all bear up on the rest of the discussions in this thesis. However, for setting up my research question, the most directly relevant one is the emphasis on the value of e-waste. Thomas's pronouncement that e-waste is unlike other wastes because it is valuable seems puzzling from the anthropologist's perspective, for all waste is potentially value though not always economic. Anthropologists of waste have long been pointing out that a thing deemed dirty by some might not be out of place for another person (Douglas 1966). Moreover that one person's waste might actually be valuable for somone else (Thompson 2017; Reno 2015; 2009; Millar 2018; O'Hare 2022; Giles 2014). Although Thomas himself was very much aware that strong, vigilant governments played a key role in making sure that the value pent up in waste's material could be profitably and responsibly recovered. His talk also implied that there is an inherent material value in e-waste that should actually drive its realise. A popular notion that has been challenged by almost all explorations of value, starting with Marx who aregued that the realisation of value was contingent on labour (Marx [1867] 1982). However, the anthropological corpus focusing on the spheres of exchange and distinct value regimes complicates this argument (Appadurai 1986; Guyer 2004). My thesis builds on these three notions of value: that waste has is an infinite potentiality to be revalued, which can be realised through broadly defined labour processes, including the work that goes into making things pass between different value regimes and be exchanged across thresholds. I do not understand any of these as given but worked out in practice that "brings universes into being" although perhaps not always with the revolutionary potential that Graeber envisaged (2013).

In the absence of the electronics industry at the event, the answer to Thomas' provocation for producer brands was given by Coca Cola. He concurred that there was a need for government regulations. However, the representative qualified, it should not be like the abruptly introduced plastic ban in Maharashtra in 2018. "The beverage industry was shut for 4 days … this is not how companies operate. We can take part in collecting, but we are still waiting on guidelines to come

in. The good thing is that plastic packaging can be recycled to a high degree. If you are looking at PET a lot of carpets and clothes are recycled out of that material." He talked of the science behind knowing consumer demand, the opinion that matters the most to the company. "[Recycling] evolved on its own because it had a value on its own; there is a huge economic element that is riding in the recycling chain … Please allow this to become carrier of lesser value. We are willing to play our part, but please enable [sic]."

When Rajiv, the young face of the Transregional Finance Association, spoke, he emphasised the growth in collections and the chance offered by models such as Sahih Kaam for investment. He repeated what he had already told me on another occasion, "Markets cannot solve everything, but in the case of e-waste they are the best solution."

When Satkar, the founder of Sahih Kaam spoke, he emphasised the growth and partnerships that have been made, not just with TFA but also with waste pickers, a fact that demonstrates the system's maturity in a fairly short amount of time. For him, while producers are asking if collection is really happening, the important thing is that the dialogue has changed and that "we have waste pickers across the value chain who are literate, filing taxes and filling forms."

Then, the government representative chastised everyone for still quoting old figures, such as 95 percent for the ratio of e-waste that is recycled in the informal sector. "I would quote 80 percent, since 20 percent targets are in place and e-waste is being channelled to the recyclers," indicating the change ushered in by the 2016 E-waste Rules. He also reflected on the figures quoted by other speakers, who highlighted the unexplored investment potential, the recyclers running at 25 percent capacity, the difficulties in legislation. The main argument of the government representative was that, since there is such a profit potential in e-waste, the private sector is in the best place to solve those problems.

A consultant produced the figure of 377,76,66,600 (in India's counting system it reads as three hundred seventy-seven crores seventy-six lakh sixty-six thousand six hundred rupees) and asked people to give a wild guess what the figure referred to. When no one seemed to have any idea, she offered: "This is how much producer brands have pledged to the government in their EPR applications." Which left, as she had probably hoped, the audience guessing where all that money had gone.

Thomas tried to have the last word, to warn against downcycling, countering the Coca Cola boast that PET is infinitely recyclable into carpets. Recycling was not an end itself but had to aim at recovering high quality materials. "The material quality is going down significantly. We need to change, but it will not come on its own. It depends on where we put the demands. We start to call

recycling when we put plastic into the asphalt; it is not doing much damage there, but we could have put it to better use."

Someone else chipped in that enabling legislations will never work in India, "penalties work better, because cheating is always going to happen."

When his turn came, Satish Sinha, the chairman of Toxics Link, the advocacy group that initiated the conversation on e-waste and drove the drafting of the E-waste Rules, spoke of how the informal sector workers remained undefined by legislation. "There are no rules to say what they are allowed to do and what they aren't, which leaves them in a grey area even though no one has better collection systems than they do." This rhymes with the unarticulated analysis that underlies the event: the informal sector is going strong, while formalisation falters despite the advertisement, improving arguments, and better numbers.

During the event, I sat at the back among the exhausted Sahih Kaam employees, who kept cracking "end-of-life" and EPR jokes, "End-of-life *ho gaya* [I've become end-of-life]" and kept commenting on what was unfolding on the dais. This has been a long day and a long month for Sahih Kaam employees engaged in organising the event and Thomas's visit. "They keep going around all events saying the same thing," Lata complained. As the day lengthened, frustration rose at the conversation on the stage, which they saw as ineffective in the face of the obstacles they encountered during their day-to-day work: the lack of accountability of recycling plants and the government's unwillingness to enforce rules in an effective manner that makes PRO operations feasible. Then Santosh, a young, cosmopolitan Delhiite and a logistics expert astutely observed, "They are talking like silent killers, nobody wants to take responsibility – they are just throwing it back and forth—it's an open cold war." Which appears a powerful commentary on Thomas's hope that everyone has been taught well enough to be willing to take responsibility.

As a reflection on how the different stakeholders threw the ball in the others' court, Santosh's comment demonstrated more effectively than any other description how the market in EPR works, or rather, how it does not work. The event was long but it gave space to Sahih Kaam to showcase the most important concern in e-waste recycling: the law was good but needed enforcement; money was recoverable but needed a further maturation of the ecosystem; achievements so far were impressive but there was a long way to go; recycling was a good aim to have but not enough; assigning responsibility was important but it had to be also taken up; solving the e-waste problem was a matter of market design, yet it was not enough to leave it to the market; it had to be made to work. Santosh's comment, on the other hand, foregrounded the biggest problem, namely that no matter how carefully the policy tool was designed to compel actors to take responsibility, in

practice the highest level of moral virtue became a moving target. A source of frustration which made Sahih Kaam hell bent on putting responsibility into practice, to keep swinging between the greatest hope and pride in their contribution, and a deep sense of doom and dejection at the thought of not making enough difference.

The event and the opinions of the attendees animated the positions occupied by the different stakeholders as well as the problems encountered by Sahih Kaam as they went about their work in the e-waste ecosystem. It was striking to see how the only people missing from the conversation were the waste dealers, despite their central role in collecting and processing large quantities of e-waste, supposedly pushed by poverty and the lack of other opportunities. The omission might seem puzzling. In many ethnographies of waste, including the work of Giles (2014; 2021) and O'Hare (2022), two authors whose ethnographies had the greatest impact on my work, ethnographic protagonists make claims to the political position of the poor and marginalised to claim their share of the waste commons. Thus, it makes sense for these authors to start from the dumpster, to start their theoretical explorations on the economic system and infrastructural politics that create waste and affect its afterlife. However, none of Sahih Kaam's aggregators made claims to being poor and precarious. Delhi's scrap dealers, especially the ones who sold their products to Sahih Kaam, were more like entrepreneurs, who did not find claims to marginality beneficial to their business. Sahih Kaam referred to them as "aggregators" because of the role they fulfilled in the company's collection channels. They called themselves *kabadiwallas* or scrap wallas, which is how I will mostly refer to them in this thesis. What they dealt in was "*computer ka scrap* [computer scrap]" rather than "*e-kacchra* [e-waste]" as occasionally I saw e-waste translated in Hindi awareness materials. My thesis focuses on the transaction between the PRO and its aggregators, scrap dealers farther up the e-waste value chain who have access to large quantities. This access is dependent on local markets, ones that are termed informal and pronounced illegitimate by those who attended the event described above. Yet, as the environmental advocacy group representative Satish Sinha said, no one has better collection systems than the *kabadiwallas*.

The task for policy makers, government officials, and international organisations is, rather than instituting a market where there exists none, to design one that replaces the already existing one of the *kabadiwallas*. This is in some sense similar, yet quite unlike, the institution of carbon markets where none had existed before (Dalsgaard 2013). The task is to design a market that makes it possible to control both the hazard and the economic potential pent up in e-waste (Kama 2015), which are the characteristics of this most enchanting form of waste (Lepawsky 2018). This raises the question of how waste, an inherently entropic form, can be made into value, to make neoliberal capitalism into green and ethical?

Gille (2007) argues that in Western market societies economic models' explain waste as a byproduct and the result of joint production, which gave rise to the imperative to dispose of it and move it out of sight. For Giles (2014; 2021) in the current system of overproduction, food waste represents the bulimia of capitalism and the act of wasting is necessary to maintain the value of products that manufacturers keep pushing on the shelf. Waste is not simply the byproduct of production, but its exclusion from circulation through sell-by dates, padlocked supermarket dumpsters and design for obsolescence it becomes an uncommodity. This gives rise to a situation where "waste is included *directly* in the commodity chain while excluded from circulation in exchange" (Giles 2014, 103). But what interests me in the ethnography that forms the basis of this thesis is the attempt to move this byproduct, liability, and uncommodity into the very centre of production and capitalist accumulation. For the environmentalist argument, that if only people were made aware of waste's value they would be more inclined to do the right thing, ignores all the ways in which divesting materials of their value, that is their wasting, is part of capitalist creation of value.

In this sense, Graeber's argument that the point of political struggle 'is not even the struggle to appropriate value; it is the struggle to establish what value is" has a particular meaning in waste infrastructures (2001, 88). The expression of ultimate political power is to pronounce something waste, that is to determine the wasteness of things. This struggle is often captured in various studies from the perspective of those who challenge the power by revaluing waste for their personal use or to recommodify often in unregulated, informal and small scale secondary commodity markets. Commentators working in Delhi often highlight the threat of legal changes to Delhi's waste pickers and scrap dealers resulting in their criminalisation and loss of livelihoods (Gidwani 2015; Gidwani and Corwin 2017; Gill 2009; Demaria and Schindler 2016). Such perspectives and concerns form the background to my ethnography of Sahih Kaam and their relationship to their waste aggregators. Yet, during my fieldwork I observed how, despite the broader endeavour to "end informal sector activities", there is in fact much room for negotiation. The threat of criminalisation and diminished livelihoods is real, but the effects of legal frameworks are rarely total. The power struggle over determining what is waste and what is value continues and produces unlikely alliances.

Rather than simply celebrating waste workers' revaluation practices as resistance to global capitalism, although I do find them remarkable and valuable, I rather turn the ethnographic lens around to think about how new waste insfrastructural experiments change the dynamics of struggle over waste's value. In this way the emphasis on e-waste' toxic materiality devalues second hand electronics to remove them from circulation in the informal market. Yet, rather than becoming

dispossessed, small scale scrap dealers are engaged in a market transaction to recover waste for sustainable, responsible reverse logistics value chains to unmake electronics. In this way, waste conflicts are increasingly the results of "attempts to establish a mode of valorisation through soci-metabolic reconfiguration" at the new commodity frontier of waste extraction (Schindler and Demaria 2020, 54). Schindler and Demaria draw on Jason Moore's argument that the end of "Cheap Nature" and "the absence of commodity frontiers constitutes the a terminal crisis of capitalism" (Schindler and Demaria 2020, 53). Yet, in their opinion Moore overlooks waste as an emergent commodity frontier that investors identified as a yet untapped source. The event that forms the backbone of this Introduction, however, is a good demonstration that this process of identification does not unfold on its own. It requires the collaboration of state, non-state, and third sector organisations to set up the terms of the socio-metabolic reconfiguration to make the waste frontier exploitable.

So alongside the classic waste worker and scrap dealer, this thesis also makes this other type of, internationally educated, office based waste worker's labour. The young South Delhi types with whom I took pictures posing against backgrounds worthy of maharajas are the new waste workers toiling away at the next frontier of value, turning waste back into production, making circular economy a reality. Moreover, e-waste's revaluation as an untapped resource requires these new waste workers to enforceme e-waste's lack of value. Based on my observations I argue that e-waste valuable materiality is far from given or fixed quality, but rather is the result of a series of material and value transformations effected through labour.

Market transactions as value transformations

Although accounts of waste and value transformations often warn against the transformation of waste commons into market economies (Gidwani and Corwin 2018b; Baviskar and Gidwani 2019; O'Hare 2022; Giles 2021), by the time I arrived in Delhi there was no sign of an e-waste commons (if there ever was one). E-waste in fact does not become waste but, since the law changed in the mid-2000s, it has been sold as scrap at auctions accessible to registered recyclers through MSTC, the website of the government authority that was set up to regulate the export of ferrous scrap (Reddy 2015). Registered recyclers, then, would sell it on to any buyer, whether licenced or not, feeding a large informal market that was often referred to as "leaking" (Toxics Link 2019). "Informal market" here refers to the way in which my interlocutors, including and determined by organisations such as Toxic Links, used the term as the unregulated, non-taxable, and non-bureaucratised space in which e-waste was bought and sold. In this sphere e-waste, originating on a large scale in government and private sector offices, continues to circulate as a commodity.

Obsolete household electronics have a slightly different route, as they get passed down to poorer, younger relatives, or to household help, before they are discarded. Alternatively, recently there have been some initiatives to make consumers sell obsolete but still functioning phones to startups, such as Cashify. Through this scheme, phones are refurbished and sold to "tier 2, tier 3 cities" for a fraction of the price. These development raise questions beyond the resistance of communities towards marketisation and worry of loss of livelihoods. In fact, the introduction of market processes may have negative effects but can also provide opportunities for others.

The policy tool of EPR, introduced in 2011 and strengthened by the 2016 e-waste Rules introduced new dynamics into the vibrant existing market in electronic discards. EPR operates as a market device aimed at establishing an environmentally responsible market in e-waste recycling. This is a case of market design with the intention of solving particular social issues (Callon 1998; Frankel, Ossandón, and Pallesen 2019; Neyland, Ehrenstein, and Milyaeva 2019). While Europe's success in designing markets for producer responsibility is held up as the ideal for Indian e-waste policy, there is evidence that e-waste EPR in well-regulated markets, such as in Britain, had also failed initially (Neyland, Ehrenstein, and Milyaeva 2019). In fact, they ask how is it that despite design often leading to market failures, there is no question of markets as the best solution to solving social issues (Frankel, Ossandón, and Pallesen 2019). While my interlocutors were not economists, the concerns to respond with ever better designs to right the failure of the market to solve the e-waste problem rings true in today's Delhi. The calls are not to abandon market solutions to e-waste but to design and regulate them better. Beyond questioning markets as solutions, my research to some extent draws on economic sociology pioneered by Callon (1998b; 1998a) and writers who follow his lead to think about the effects of policies as they are introduced to the social field. Yet, I find Callon's concept of framing and overflowing limited in understanding the situation that unfolds in the e-waste sector in Delhi. For perhaps the informal market and their toxic effects could count as overflow in Callon's terms, but that suggest an element of lawlessness. In contrast, while the informal sector is non-taxable and less regulated through laws it is a rather well-organised market already.

My interest lies in examining the processes unleashed by the introduction of EPR into the secondary electronics sector dominated by informal actors. What I found was that EPR, intended by Thomas in the 1990s as a policy tool to force producers to keep in mind end-of-life fates at the design phase, in fact turned into a tool for market design. However, while some of the issues encountered by Sahih Kaam in the e-waste ecosystem were to do with the bad design, a substantial part came from the fact that EPR as an economic tool, similarly to other parts of the world, was not applied in a social vacuum but an already saturated landscape (Weszkalnys 2011). I call the

processes that are set off by the introduction of EPR as forces of formalisation and followings are an exploration of how intentional design plays out in interaction with the already existing market forces. Early responses to the proposed legal changes voiced concerns about criminalising scrap dealers and pushing them out of business (Gidwani and Corwin 2017), thus jeopardising livelihoods. However, I found that in Sahih Kaam's and other new actors' interpretation the law had a strikingly different effect. Instead of "closing down the market," a fear palpable locally in Kabadabad,[4] manifesting in rumours around my nefarious role, another sphere came about, which Sahih Kaam calls the e-waste ecosystem aimed at channelling scrap into responsible channels. So rather than the intended market that would result from EPR, or the resistance of local ways of organising, in effect, the two are becoming complementary and competing spheres of exchange operating alongside each other. Formalisation would require the design of a market that replaces the old one and functions in a clean, controlled, and documentable manner but vernacular markets, where scrap exchanged hands, proved to be less precarious than expected.

Rather than replacement, the situation is somewhat similar to the one Guyer presents in *Marginal Gains* (2004). In her historical overview of the Atlantic African economy, she finds that money, rather than an alien means of exchange introduced by the colonisers, has long been a feature of local trade. The colonisers merely contributed with their own currency when they entered the already existing market systems in Atlantic Africa. Dealing with the multiplicity of currencies was the order of the day for inhabitants, and colonial monetary systems added to that complexity instead of replacing them. In fact, periodic introductions of new currencies and their concomitant devaluation have aided the form of accumulation she terms "marginal gains." Marginal gains, then, mean the incremental profits made on conversions between different value scales, between different regions, denominations, systems of measure, etc. She draws attention to how, despite theorist's confusion at the shifting and continued scales of measurements, people find a way to work with them. I follow Guyer in her ethnographic interest in how people at different points in the market suture together various scales of value through practice. Such a focus helps to think of the various ways in which "marginal gains" are made from e-waste in market exchange, as well as the change induced by formalisation.

I see formalisation as the attempt to fix conversion between value scales, which is driven by the modern state and is aimed at the standardisation of such a conversion process. In Guyer's words,

[4] Kabadabad is what I call the particular e-waste market in the North-Eastern peripheries of Delhi, from where Sahih Kaam sources its waste and where I conducted ethnographic research. Kabad means waste, and the suffix -abad means a place of settlement. Thus, Kabadabad means "the place of waste." My urge to anonymise these places is rooted in the process related to the link between accounts of e-waste recycling and police harrassment.

"Formalization is the modern state's counterpart to conversion. Legal texts and conventional quantitative measures bring different value scales and different modes of measurement into relationship with each other. The difference, in theory, is that the value relationship is treated officially as a permanent reduction to a particular systemic logic, not as a performative moment to be re-created at every transaction." (2004, 155). What Guyer means here is that formalisation means the introduction of fixity into an economic landscape where flexibility and make-do attitudes are the most important economic principle and the basis of profits. The state is but one of the multiple sovereignties that determine the circulation and value of things. What matters for my ethnographic exploration is that market design in EPR is bringing the promise of fixity in value conversion, however, with the shortcomings of policy implementation and the lack of enforcemen from the government's side continues a state where implementation requires the constant suturing together of different value scales. Thus, for me, the attempt at the introduction of a formal market in responsible e-waste recycling under EPR provides an opportunity to examine the labour that goes into working through the various value scales, of which formalisation is but one, and how they play into each other in action.

The Indian markets' relationship to the global economy has no less of a history than Atlantic Africa. Exchange has been at the heart of anthropologist's interests in India's transactional culture. While it is important to state, as Schwecke and Gandhi (2020) do, that market relations have undergone significant change since Barth's and Marriott's time (Barth 1965; Marriott 1968; Marriott and Inden 1977), the latters' work continues to hold significant insights for South Asian societies today:

> First, a society saturated by transactions – public gifting in Barth's terms but also commodified market exchanges – means a social dimension that is incomplete and unfolding. Society does not exist without the perpetual labour of exchange. Second, the transactional here is not reducible to material expediency. The labour of the social yokes together the practical, the ethical, and the cosmological (Schwecke and Gandhi 2020).

While there is benefit in emphasising change, there are also enduring structures that make it important to pay attention to the continuing importance of community to capital (Birla 2009; Schwecke and Gandhi 2020). At the same time, the authors highlight that this does not mean a specific Indian recourse to community; individual drives, opportunity, communication, information flows, etc. are equally important to making Indian markets work.

The focus of this thesis is the exchange relationship between Sahih Kaam and its aggregators and each chapter traces one aspect of value and its transformation. The point of departure is price

composition (Guyer 2009) which illuminates the materiality of e-waste, and how that determines its decay an breakdown, indexing a lingering use value (Reno 2016; Kockelman 2016). Use value in e-waste, however, is of an unstable kind and carries the potential for revaluation or, if not treated properly, of toxic effluents. Scientific notions of pollution and toxicity may not conform to ritual notions of pollution (Pathak 2020), but chemotoxic substances are transactable in a way similar to Marriott's biosocial substances (Marriott 1968). Moreover, the advocacy and environmental campaigners are interested in transforming certain practices of e-waste recycling into a stigmatised form of labour, in order to devalue e-waste circulating in the sphere of the scrap market (Corwin 2020). The lingering use value can be extracted as economic value by the PRO operating in the EPR framework through working out structures to enable "replacement" (Kockelman 2016). The economic exchange between PRO and aggregators is enabled by the pursuit of ethical values, environmental responsibility, and social mobility respectively, each in some sense non-compatible with, even contradictory to, the other, but cohering in a relation of exchange. Lambek's (2008) insistence on not glossing over the incommensurability of ethical values and economic value but keeping it at the centre of enquiry directs my attention to practices that are aimed at suturing together these incompatible value scales.

To understand the way in which Sahih Kaam goes about effecting value transformations, I also draw on a body of work on the anthropology of value which focuses on transformative action (Munn 1986; Graeber 2001). In Graeber and Munn's sense, transformative action is oriented towards the larger good of a community or society and not narrowly defined economic goals. Based on this notion Graeber (2001) distinguishes between value and values. The focus on value transformations also provides space to think about negative value. Through such a lens it Sahih Kaam's attempt to creates connections and associations with many different kinds of actors (NGOs, consultants, international organisations, environmental experts, anthropologists) and their ethical commitment to doing the right thing points towards a goal that goes beyond material gain. Much rather they are pursuing higher values to transform the e-waste ecosystem for the wider benefit of society of solving the environmental crisis caused by e-waste. More recent interpretations of the issue of transformative action draw attention to material transformations (Laser 2020; Sanchez 2020). An attention to the materiality of things transformed in pursuit of value transformations brings into view the issue of negative value, in the form of toxic effluents as a result of non-conforming material transformations. The threat of toxicity devalues some forms of value transformations but also sets the base for the positive value transformations that Sahih Kaam seeks to effect.

The various sources of value can also be understood to be operating as distinct value scales, between which making conversions possible creates not only economic value but non-economic values, too. Ultimately, the question of Sahih Kaam's success as well as that of the wider shift to a green economy is, whether ethical values of environmental responsibility can be made the source of economic profit making, and become the new frontier of accumulation. My thesis examines Sahih Kaam's attempts to make such a seemingly impossible shift possible.

Waste's materiality as value

Waste and value have been receiving considerable attention recently in anthropology. To a large extent this might be following the wider interest in "the rising tides of waste" (Alexander and O'Hare 2020; Eriksen and Schober 2017). Intending to add to the wide range of interdisciplinary enquiries that anthropology does best, much writing aims to recover the everyday life and dignity of the marginalised waste worker (Millar 2018). However, upon closer look beyond the anthropologists' interest in "dark anthropology" (Ortner 2016), and "the suffering subject" (Robbins 2013), there is a fascination with waste as a conceptual category. This originates in the way waste has been conceptualised as a boundary object par excellence (Star 2010).

Alexander and O'Hare (2020) argue that writing on waste can be sorted into three categories: symbolic-structuralist approach starting with Mary Douglas and the concept of dirt (Douglas 1966); an economic and materialist approach drawing on Thompson's *Rubbish Theory* (Thompson 2017); and more-than-human interspecies approach. Whether or not writings can be categorised so neatly, with Douglas's influence palpable across the board, all categories share "an interest in the afterlives of waste" (Reno 2015). For Douglas, dirt and pollution is what disturbs structure and, therefore, must be cast out and banished to re-establish order. Through the process of elimination and discarding, or simply assigning matter its right place, a sense of what is good and proper for each person or cultural system is revealed. Wasting then is considered to be a thoroughly ethical engagement (Hawkins 2006). Yet, while dirt brings to attention the use of categories and their imposition on society and matter and the relation between sorting and order, the concept of waste, especially mass waste, cannot be easily equated with dirt (Reno 2016; O'Hare 2022; Alexander and O'Hare 2020). In fact, while dirt is conceived of as "matter out of place," much of the concern about wastes today is about the collection and exchange of waste and waste's materiality. Here, rather than the banishment of waste, the focus is on the continued engagement with waste and the various forms it can take. Moreover, rather than the expulsion of dirt to maintain order, this implies an engagement with matter and its potentialities for humans to live in

an irrevocably polluted environment (Shotwell 2016; Liboiron, Tironi, and Calvillo 2018). Yet, despite this, as Shotwell argues (2016), people continue to hold on to the notion of purity.

The main concern that goes beyond the concept of dirt is waste's materiality and the potential for wastes to continue to have effects beyond the time of discarding (Gregson et al. 2010; Crang et al. 2012; Reno 2016; 2015; Hawkins et al. 2015). This causes even more pronounced issues when individual acts of discard produce mass waste that ends up in the landfill, producing more-than-human geographies of Anthropocene (Reno 2016). Waste as scat becomes a sign of past lives, as the severance of links between previous owners and discarded objects is never quite complete (Corvellec 2019; Reno 2014). When wastes are mixed together, their various kinds of potentialities enter into interaction with one another, causing environmental distress and harm.

The excluded and marginal waste-picker emerges as the ethical anthropological subject out of critical engagement with often middle-class concerns with cleanliness, purity, and world class cities. The figure of the waste-picker and -worker first appears through an interest in informality and urban poverty (Hart 1973; de Soto 2000). In India, Gill (2009) explains the scale of informal sector plastics recycling as the result of increased demand for recycled products and the supply of cheap labour in the liberalisation era's jobless growth and unemployment. The language of waste was revived in the context of the "crisis of work," because it "reinforces the persistent paradigm of seeing the poor, marginalized, and suffering in terms of scarcity" (Millar 2018). Most enquiries, then, found that, rather than scarcity, waste has much more to do with abundance and overproduction (Giles 2014; 2021; Gille 2007; Doron and Jeffrey 2018). Rather than an evidence of necessity and extreme precarity, the ethnography of waste work was directly countering the association of waste with the "wasted lives" of capitalism's outcasts (Bauman 2004). Millar (2018) argues along with Gidwani (2015; 2013; Gidwani and Corwin 2018b) that, far from dire necessity and extreme forms of disposability of life, waste reclaimers are central to the governance of the city. Moreover, waste work becomes the basis for particular life projects that are not devoid of all dignity. On the contrary, they offer modes of living preferred, for example, by Rio's precarious workers (Millar 2018). In a similar vein, other ethnographies explore how through labour, waste is reclaimed, transformed, and made the basis of a good life, precarious and labour intensive, but not dominated by a sense of scarcity (Nguyen 2018; O'Hare 2022). Going beyond that, O'Hare's interlocutors in Uruguay make a claim to their poverty in order to make political claims on the waste commons in the face of the state's hygienic enclosure (O'Hare 2022). However, the landfill and the dumpster, the waste picker and reclaimer, are still considered the departure to criticise capitalist relations, inequality, waste governance (O'Hare 2022; Giles 2014; 2021; Reno 2016). In

a curious way, the arguments recovering the waste workers' dignified labour and way of life do end up reinforcing and reaffirming the association of waste with marginality.

This is not to dispute the important contributions of ethnography, starting from "the analytic dumpster" (Giles 2014). From the point of view of the marginalised, distinct "waste regimes" come into view (Gille 2007). Here, it is important to mention Gille's work as a more systemic sociological comparison of socialist and post-socialist Hungary's waste regimes. O'Hare's (2022) interlocutors lead him to examine the effects of hygienic enclosure, the urban government's effort to pronounce waste what Uruguay *catadores* could revalue for personal consumption or market exchange. He also follows the waste workers' labour experiences as part of collectivisation and formalisation processes in the city's waste regime. This provides an excellent vantage point to break the association of formal sector employment with increased job security (O'Hare 2019; O'Hare 2020). However, my take on formalisation diverges from O'Hare to refer more to market forces rather than labour patterns. What matters for my argument below is the detailed attention to the classification of wastes by the municipality and the enforcement of that classification through material practices that are aimed at keeping *catadores* off the dump, which O'Hare calls hygienic enclosure. I interpret this as having close association with Giles's (2014; 2021) abject capital, where to prevent devaluation due to overproduction and the saturation of markets under capitalism, supermarkets push products off the shelves into the bin to make space for new commodities on the shelves. Yet, many of the products are still good for human consumption past their shelf life, though placing them in the dumpster makes this unpalatable for most.

Both the concepts of "hygienic enclosures" and "abject capital" point towards class judgements of purity and pollution, in a similar way to Baviskar's bourgeois environmentalism (Reddy 2015). They also point to the relativity of what is waste, for one person's waste is another's treasure (Reno 2009). The main takeaway from that is that classifying something as waste and ensuring that it is treated that way is a question of power. However, "the indeterminacy of waste" (Alexander and O'Hare 2020) means that there is little chance that the power over classification will remain unchallenged.

The waste-workers' marginality and wastes' abjectness are produced in environmental advocacy and media portrayals of e-waste. The depictions of e-waste dismantling and recycling sites across the world as hellish landscapes wherever used electronics are dumped, burned, and dipped in acid without any protective equipment, are deployed to similar ends as O'Hare's "hygienic enclosure" and Giles's "abject capital." They highlight that, while wasting is a matter of exercising power, it actually creates an arena of struggles over value. To have the power to call something waste means,

on the one hand, to produce "waste commons" and "abject capital" but, on the other, recovery of waste is often interpreted as a challenge to state authority. Nowhere is this value struggle more pronounced than in the case of e-waste, which is not only a charismatic form of waste (Liboiron 2016) but also a high value one. Moreover, establishing the wasteness of e-waste requires the use of exaggerated metaphors, the use of numbers and calculations, and the writing of reports (Lepawsky 2018). These are aimed at producing a sense of abjection and disgust, which is not yet as deeply ingrained in the senses as is the placement of food stuffs in bins in the US, or as caste judgements in India (Lee 2021).

E-waste is in fact a waste unlike those mentioned above; it does not break down on its own, the waste/non-waste boundary may be even more blurry than in the case of food or even plastics, and it consists of high value materials. Yet, despite evidence to the potential for becoming the source of secondary resources, from the early 2000s e-waste has been framed as a problem of post-consumption waste and of its management (Lepawsky 2018). The explanation for this lies as much in local shifts in environmentalism, such as described above in Delhi, as global shifts in conceptualising wastes, including the policy interventions and EPR introduced by Thomas Lindhqvist. Despite the potential for revaluation, the breakdown of wastes' management and their public presence has become synonymous with India's infrastructural backwardness (Doron and Jeffrey 2018). Yet, e-waste in fact becomes a problem because it is not a waste at all but high value scrap that includes a significant amount of recyclables, such as steel and plastic on top of high-value, highly recoverable non-ferrous metals. Copper and gold are the most easily recoverable, even if causing significant environmental damage in the process, while other materials, such as platinum and palladium, require a higher level of technological arsenal. The promise of copper and gold is also the driver for the informal sector activities that cause environmental degradation. The material proclivity towards continued reuse and the extensive repair cultures that grow up around this in Delhi, keep electronics from becoming waste (Corwin 2018b). Many of the practices of processing are in fact non-polluting (Lora-Wainwright 2017), although the scrap circulating in the value chain finally ends up in polluting activities. Yet, as Lepawsky (2018) and Corwin (2018b) point out, those activities that are characterised as informal sector work had been performing environmental services there, where environmentally responsible e-waste processing technologies and markets were non-existent until recently. In the face of this, pronouncing electronic discards as waste performs the same process as hygienic enclosures and abject capital. The value struggle is similar to, but not quite the same as, the moral right to keep using things that are useful, keep eating things that are nutritious, instead of letting them rot (O'Hare 2022; Giles 2021). The argument around e-waste has turned from the righteous indignation due to environmental racism

(Smith et al. 2006), to the question of who has the right to recover value for monetary value, with the balance heavily tilting toward those with corporate backing and access to technology.

Valuing and transforming waste

Waste is often characterised as the lack of value. Yet, despite the narrative about the e-waste crisis, there is a strong sense that e-waste in India remains valuable throughout its "social life" (Appadurai 1986; Kopytoff 1986). If anything at all, the main problem encountered by my interlocutors, Sahih Kaam, and their aggregators, is that e-waste continues to have high value in the markets that have organically grown up around this secondary resource commodity. The value of e-waste is usually at the centre of discussions, contrasted to its potential to turn hazardous (Kama 2015; Knapp 2016; Corwin 2020). Economic value and a potential hazard are usually presented as a contradiction, but anthropological theories of value might provide a potential for thinking about both within the same value regime. Moreover, my research highlights the question of value transformations that are made possible by e-waste's duality that makes it straddle several value scales, and which are effected by Sahih Kaam's attempts at revaluating environmentally responsible services in e-waste recycling as a commodity.

Therefore, the value struggle around e-waste is not, as in the waste literature above, between continuing the circulation of objects or stopping it. Pronouncing scrap as waste means redirecting it from already existing spheres of circulation to new markets in environmental responsibility. Scholars of e-waste have found that the bulk of electronics discards continues to circulate through practices of repair and care long after their estimated time of obsolescence (Corwin 2018b; Lepawsky 2018). Corwin, in her thesis on e-waste in Delhi, argues that "the vastness of Delhi's extended used electronics economy and not its electronic waste sector … defer and reverse the transfer of used electronics into e-waste" (Corwin 2018a). While my thesis does not look at repair as a mode of revaluation, it builds on this excellent study of Delhi's repair economy as part of global circulation. I find Corwin's work especially useful since its focus on repair explains why Sahih Kaam's employees were handling what they called "legacy waste," that is electronics that were at least twenty if not forty years old. Redefining "*computer ka scrap*" or "*kabad*" as waste can be seen more as an attempt to reduce the value of materials with a high exchange rate, so that those working within the frame of the 2016 e-waste rules could access it at rates that make recycling possible. However, their power to redefine scrap as waste remains limited in the face of extensive repair cultures as described by e-waste's robust value regimes of the Kabadabad Maliks, who continue to circulate *kabad*, while negotiating forces of formalisation.

The frame of Michael Thompson's *Rubbish Theory* ([1979] 2017) has recently become popular in providing inspiration for waste scholars. This, despite the fact that it was originally written as a theory of value, using the term rubbish as a metaphor that helps him examine moments of value collapse, which he calls crisis theory. Thompson's theory has been especially helpful in improving on "the social life of things." In the meantime, Appadurai's and Kopytoff's (Appadurai 1986; Kopytoff 1986) approach has helped to draw attention to objects as their value changes during their circulation through different value regimes, their status shifting between that of the commodity and gift and back again. An interest in "the social life of things", along with Marcus's multisited ethnography (Marcus 1995; 2009), spawned a series of "follow the thing" kind of ethnographies spearheaded by Tsing's exploration of the global value chain of matsutake mushrooms (Tsing 2015a). Tsing argues that the basis for value accumulation in the matsutake value chain are the ruins of capitalism. She uses the idiom of the gift to understand the non-economic values that are turned into profits (Tsing 2013). While e-waste provides another example of salvage accumulation (Tsing 2015b), I find the idiom of waste a more illuminating one for my argument about value produced from material breakdown and attrition.

More recently, with a revival of interest in waste, Thompson's (2017) old thesis was taken off the shelf to introduce the third concept, waste, a point of zero value and indeterminacy, from which objects such as old cars, houses and antiques can bounce back to becoming precious commodities. While used cars progressively lose their value, some objects, once they are put back on the map of commodities, continue to increase their value exponentially, defying the labour theory of value (Marx 1982). Thompson's waste revaluers, the young and creative knocker-throughers, find an opening in the liminal phase that discarded things occupy before their value returns. These concepts have been particularly important for understanding the shifts in the status of objects between commodities, gifts, and waste, and back to value again (Alexander and Reno 2012; Gregson et al. 2010; Hawkins et al. 2015; Corwin 2018b; Reno 2016; Lepawsky 2018). While these approaches underpin much of what I attempt to do in this thesis, my ethnographic material, the materiality of e-waste as an object that breaks down as it is categorised and exchanged, challenges the unity of objects with which these approaches operate (Gregson et al. 2010). The social life of things often implies a reindividuation from mass waste due to their continued use value as objects, whereas all of e-waste is commodifiable when fractions are separated and grouped together in quantities by knowledgeable hands. As e-waste circulates, it is not merely objects that are exchanged, but is materially transformed opening up the possibility for value conversions.

The social and material form and the relative value waste holds—for some none and for others plenty— lends itself easily to value-creation both for those at the bottom of society and for private

capital. Alexander and Sanchez (2018) attempt to theorise waste further as indeterminacy, the formlessness of which breaks down the binary between the determinate forms implied by waste and value. They draw attention to the role of categories and sorting to the creation of wastes, which are most often attributable to larger totalities, value systems, states and society (Bowker and Star 1999; Lampland and Star 2009). Based on this, Alexander and Sanchez argue, sorting and categorisation produce uncategorisable objects and things, neither waste nor value. Indeterminacy, then, is the conceptual space which makes possible the making of value. If sorting creates waste, it is also possible to create value again. As waste workers sort through the material, they group steel with steel, glass with glass, copper containing parts with copper, and sell it on as reclaimed secondary resources. Pollution is often produced as a side effect of the indeterminate uncategorisable matter, which then becomes the basis for social categories.

Sorting things, however, is not as simple as it sounds and draws on collectively established judgements of worth (Fourcade 2016). Fourcade argues that what we know is organised by three value judgements: nominal, ordinal and cardinal. The three are often not separable but rather they feed into each other patterning social life and politics in particular ways. Naming and sorting something as e-waste, informal sector, responsible recycling, or formalisation, creates nominal categories by which a common quality is assigned to a wide range of different kinds of phenomena. The cardinal judgments about the volumes of e-waste to be found in the world in turn make monetary value calculable. Further judgements, such as the one stating that 80 percent of the globe's e-waste is handled in the informal sector, linking cardinal judgements to nominal ones, gives way to ordinalisation. This means the reinstatement of hierarchies that nominal and cardinal judgements were meant to erase in the first place in the liberal democratic project. Thus, the magnitude of the problem demonstrated in numbers and high rates of growth and the large sums of money that could be recovered once the informal sector is controlled, lend themselves to ordinalisation. Guyer talks about the return of ordinal numbers in the form of rankings, which in some way herald the return of medieval obsessions with heroes, which go against claims to equality of liberal democracies (Guyer 2010). Fourcade's (2016) term ordinalisation goes further to link collectively made categories with embodied effects, the creation of new subjectivities. Thus, sorting waste is not only about classifying materials, but it also invites value judgements on the people who are involved in waste work and creates particular subjectivities.

Doherty and Brown (2019) introduce varied actors, such as Dutch tourists who pay to fish plastic out of the canals, or pickers of berries in Chernobyl's radioactive forests, who sell the fruits of their foraging to wholesalers with Becquerel meters. Waste work is, then, the source of value, much in the same way as labour is the source of value in production (Marx 1982). Yet, waste work, not

untouched by the low status of the materials being handled, is often devalued, not the least in Delhi (Gidwani 2015). While waste work in India is supposed to be polluting in the ritual sense, too, the global metropolis is providing a space of anonymity, in which new social groups, apart from castes with hereditary occupations, are drawn into waste work (Baviskar and Gidwani 2019; Kornberg 2019). However, this does not mean that caste becomes less important to the labour creating waste intimacies (Butt 2019). Both Butt (2019; 2020) and Kornberg (2019) point towards the tendency of caste groups and particular sections of migrants to specialise in particular kinds of waste. Rather than on vulnerability, some of this recent work focuses on the space of sociality that is enacted through waste work at the bottom of society (Butt 2020) and the satisfaction of the material and value transformations that are effected (Sanchez 2020). Sanchez reframes Graeber's (2001; 2013) location of value in creativity to argue that a subjective experience of destruction as satisfying comes from the awareness of the transformations effected.

Recent works on waste work titled "Labour Laid Waste" (Doherty and Brown 2019) and more widely labour "Dislocation of Labour" (Harvey and Krohn-Hansen 2018) in fact complicates what is considered waste work and whose experience counts as ethnographically relevant. However, it is also important to emphasise that the scrap dealers I encountered were engaged in labour that was only partly aimed at simply material transformation and deformation (Greeson et al. 2020; Laser 2020). The pursuit of value transformations does not end there but strives to engage in exchange and circulation. In fact, the values of entrepreneurship masked labour behind an emphasis on circulation and exchange in a similar way to Harvey's and Krohn-Hansen's (2018) interpretation of Strathern's *Gender of the Gift* (1988). In this sense, this also echoes Marx when he says that commodities do not take themselves to the market, but people have to take possession of them (Marx 1982). I draw on such interventions to complicate further who counts as a waste worker by focusing on young professionals in the corporate sector who are proud to be working in the e-waste sector.

Waste work is not restricted to the poor or the marginalised, nor to the action of hitting differently shaped electronic scrap with a hammer and a well-placed chisel. There are a range of other actors in Sahih Kaam's e-waste ecosystem, including employees, who take part in the transformation of discarded electronics into secondary resources, an intensely social activity (Richardson and Weszkalnys 2014). Although the objective conditions of the labour of Sahih Kaam's office employees are not quite the same as those of the *kabadiwallas*, they are both in similarly opposing relations to capital. This, perhaps the complication notwithstanding that the employees of the company are the wage workers, while the *kabadiwallas* are more akin to small scale entrepreneurs

(Bear 2015). The waste labour I am interested in in this thesis is rather that of making waste circulate and break down in specific ways.

Reddy and Corwin (Reddy 2015; Corwin 2020) highlight how judging something informal is aimed at devaluing the labour of waste workers, that is, the demographic that I call scrap dealers and *kabadiwallas*. This devaluation, the ordinalisation that is implied in the various ways in which the informal/formal dichotomy continues to be articulated on the ground despite the lack of material basis for it, also creates the incentive to intervene. Thus, my thesis by following the interactions between two iconic demographies of the Indian republic, those working in and inhabiting corporate India and those working in and inhabiting informal Hindustan, interrogates the implication of values that such dichotomisation effects. In some sense, the informal and formal divide can be seen as the resurgence of binaries that Robbins and Siikala (2014) talk about. The binaries of global/local, modern/traditional, equal/hierarchical, formal/informal can be all understood as judgements of worth and as the ordianalisation of nominal judgements. These judgements of worth make the world knowable, but the binaries are the effect of cultural tensions that follow social change that anthropologists get so excited about.

The question of commensuration is becoming anthropology's method to examine the cataclysmic shifts in society that are happening with the environmental crisis, the pandemic, and a deepening economic crisis. Ecks (2022) proposes an embodied theory of value, which is based on biocommensuration, a comparison between things, one of which at least must be alive to evaluate what improves life. Embodied value is rooted in life and what makes it worth living, which every living being takes part in, though only humans can create schema for the accumulation of value. Ecks takes as one of his examples the Great Lockdown of 2020 and argues that biocommensurations break down when routine ways to evaluate comparisons are not available. I argue that setting up responsible e-waste recycling may have the improvement of life as its ethical object, yet the lack of routinized comparisons that allow stakeholders to know what practices improve life better than others makes the project stand on shaky ground. Kockelman (2016) examines the question of what it means to draw equivalence between various human and non-human entities in a Guatemalan eco-reserve. He argues that the adoption of new values is grounded in already existing cosmologies, but requires new forms of enclosure, the cementing of paths of equivalences, through "immaterial labour." In Delhi, the nominal and ordinal judgements that saturate society create the grounds for working out commensurability in the e-waste ecosystem in practice. Already existing practices based on low-investment technology backyard operations provide local livelihoods and a steady path to social mobility to many. Whereas, while responsible reorganisation of recycling channels may have the wider public good in mind, there is reasonable

fear that, were it to succeed, it would enrich the few. Following Ecks and Kockelman, my thesis traces the working out of new equivalences and commensuration through transforming waste in light of the multiple sources of value and the new equivalences and commensurations entailed by the emergent infrastructure project of setting up environmentally responsible e-waste recycling. Not satisfied with simply stating that there are multiple sources of value (Otto and Willerslev 2013), I ask how different values rooted in materiality, culture, bodies, ethics, and labour play into each other and effect value transformations. And what kind of value transformations are required and effected by the process of market design aimed at solving the crisis of e-waste?

Research Aims and Objectives

The decision to frame the research question around the efforts to make e-waste recycling in India environmentally responsible, bring into motion and animate the concepts that have been emerging from discard studies and the anthropology of waste. At the same time, it provides a different entry point into the debate, where usually anthropologists have been keen to approach questions of waste management from the "analytical dumpster" as Giles (2014) advocates. On the one hand, the question helped align my research questions with the concerns of my interlocutors and provide grounds to potentially help contributing to the better management of waste. This I hoped would help in gaining better access to spaces of decision making and offices of corporate players. However, even in terms policy suggestions my question was not so much to determine whether Sahih Kaam's solutions worked or not, whether they are the right ones or not. Rather, I was interested in taking seriously the company's commitment to the pursuit of a larger ethical good and sifting through the consequences of that, highlighting along the way the bottlenecks and contradictions of implementation. The approach opened another entry point to think about waste management systems and an insight into what happens when everyone is supposedly on board with changing in the interest of solving the environmental crisis. On the other hand, the question also led to theoretical discussions that build on but go beyond the existing discussion on waste in the anthropological literature.

From early on I have been fascinated with the implications of paying close attention to materiality and the material effects of sorting waste—a central occupation in the emerging waste literature as can be seen from the above review. The case of Sahih Kaam and their efforts to change the way e-waste is recycled in India, where the informal sector has dominated the sector, provided a new lens through which to understand the implications of waste work. The concern with establishing a circular economy in e-waste raised questions of implementation that is at the heart of environmental policies—the pursuit of a green market and a new economic order which

provides solutions to the ecological crisis—but also provided grounds for anthropological explorations into how such a malleable, multiple, and indetermiate concept as circular economy would be put into practice. While circular economy has as many different meanings as there are writers and practitioners of it, I took it as a new infrastructure and calculative logic that provides space for commensuration between materials, markets, and social values, with far reaching bureaucratic and material implications of regenerating secondary resources. My study of circular economy builds on but to some extent contrasts with the emerging corpus of discard studies and anthropology of waste, where the emphasis has been on wastes as the source of non-market value to marginalised communities. In contrast I found that circular economy solutions to solving the e-waste issue raises questions about its markets and the circulation of high value waste as a commodity. The literature on e-waste emerging mainly from geography has shown that e-waste continues to be bought and sold in vigorous local markets that implied material transformations (Lora-Wainwright 2017; Lepawsky 2018; Corwin 2018; 2020), some of which contributed for the toxicity and pollution that the e-waste issue had come to be known by. Yet, the discussion continued to centre on questions of justice rather than exploring and explaining the value chain through which things get unmade with the exception of Lepawsky and Mcnabb (2010). For me this was a significant omission, since EPR the globally accepted policy solution to the crisis of e-waste turns out to have wider market implications and appeared to have shifted the discussion from environmental justice to profitablity. Thus, my research contributes to discard studies and the anthropology of waste by bringing under examination the process that has been gaining importance but remained implicit in social studies of waste so far—the market in wastes.

Through these exploreations I was also keen to adress some important questions around caste, class, and social change in India. Framing my study through the question of waste recycling and efforts to improve it and focusing on Sahih Kaam's activities to do so brought out aspects of social change that would not have been possible to address through more classically defined Indianist questions. Going against the grain of much of Indian anthropology, my study placed at the centre of inquiry Sahih Kaam, a small for-profit company in the corporate sector; its scrap suppliers, small, family entreprises; and the economic relationship between the two. Through such a focus my ethnography brings out dynamics of inequality and social change that have been characterising the booming Indian capital in the past decades but would have been hard to grasp through a focus on either one of the two groups. At the centre of these changes are the relationships between India's strengthening middle classes and those who are being left behind—various lower castes and classes, Muslims, Dalits. Dalits and Muslims in particular have

been the subjects of recent Indian anthropological literature to understand marginalisation but I chose to focus on the development of new waste infrastructures as the frame that allows for seeing the dynamic relationship unfold between different sections of metropolitan society rather than the more static view of recounting the experience of marginalisation. Through my approach, another image emerges of unlikely alliance and cooperation through the class and caste divide, which complicates notions of marginality. Before going to the field, I assumed as many people do that e-waste would be handled by Dalits, India's ex-untouchables. A significant finding, corroborated by more and more Indian experts I talke to is that scrapdealers, *kabadiwallas* and their regional equivalents in regions where languages other than Hindi is spoken, in fact come from lower caste Muslims. Why this may be the case I can only speculated about but is beyond the scope of this thesis but would be a worthy subject for further exploration. I do however propose one way to approach the changes in India's deeply hierarchical and unequal social structure is to examine the wider implications of sorting and ordinalisation—that is practices of valuation. Through this the concepts informal/formal emerge as ethnographic categories that determine and stand in for further value judgements. In this way informality and formality, besides denoting particular types of economic processess, also emerge as a new metaphor of the class and caste divide mobilising aesthetic and technological assumptions along the way.

Given my interest in uncoverning the processes of buying and selling e-waste and the market, and the change or lack thereof due to forces of formalisation, starting my fieldwork from the offices of Sahih Kaam was the most evident choice. I spent three-four months in their office in Gurgaon to learn about the issue through the PROs eyes as it promised a hitherto unexplored perspective in discard studies. The association with the PRO also allowed me to keep in the know of and take part in events that were happening around the topic of recycling, such as the one recounted in this introduction. However, I did not pursue connections with policy makers and civil society organisations beyond my encounters with them through Sahih Kaam as I found that they would have taken me away from my central occupation, which was centering around the potentials and obstacles encountered by an ethically committed actor. The notable exception is the two-part interview I conducted with Mr Satish Sinha, the associate director of Toxics Link about the organisations's role in bringing about the legislation. Now I recognise that I should have perhaps done a few more interviews with the other organisations that have been involved in pushing for e-waste legislation to complete the historical background. There is certainly grounds for further exploration in this direction.

Rather, by following PRO employees out of the office I started making connections with scrap dealers in the market. This was also the result of the realisation that anthropologists are expected to be experts on the small scale, informal spaces and processes, for it is this knowledge that would make the anthropologist welcome at the experts' table. Yet, a few pilot trips to Northeast Delhi's e-waste markets in the first few months of fieldwork made me aware that the high-profile media coverage of "where e-waste goes to die" had caused those operating in these markets to be extremely guarded and secretive when approached by unacquainted foreigners. Faced with the choice of having to roam around these hostile markets until people got over their fear that I might be there to close down the market and got used to my presence, I chose otherwise. The choice was also informed by the understanding that as a white woman I was always going to be out of place in the open market, which is a precarious condition not at all to my liking. Instead through Sahih Kaam I got introduced to their main scrap dealers or aggregators. The scrap dealers who populate the following pages were already used to people coming through Sahih Kaam and getting questioned on their practices, though no one stuck around as long as I did. Visitors would turn up for an hour or two then leave. I, on the other hand, rented a room and spent part of each week for six months in the area. Sahih Kaam's scrap dealers welcomed me as they thought a closer relationship with me could strengthen their relationship with the company, but this connection also restriced my movement in the market. The scrap dealers continued to associate me with Sahih Kaam, which allowed them to open up their practices to me, but they also had to guard against establishing connections between further scrap dealers and the company. In this way, I did have chats with scrap dealers not connected to Sahih Kaam, but I could not follow up on those chats to explore how they operated in the market. This, being as much a limit as a learning opportunity, allowed me to see the way in which secrecy created an appearance of scarcity and how the knowledge of things and connections operated the market, which became the basis for chapter six. At the same time, such a situation further helped me to focus on the exchange relationship between Sahih Kaam and their aggregators instead of branching out to too many different directions.

Given the fact that all these scrap dealers were men, none of whom employed women in their warehouses, I did not gain access to the gendered aspect of e-waste labour. I was only once allowed inside a warehouse (belonging to one of my interlocutors' cousins) where women sorted through different components that came off motherboards, but I was quickly rushed out without being able to talk to anyone. My own gender was in fact quite a hinderance and the research would have taken a very different turn had I been a man. I could have spent much more time without feeling bothered or awkward in public spaces and talked to a much wider variety of

people. But throughout this time, I was also aware of the privilege my gender afforded to me as I was welcomed in the families, something which would have been impossible for a man in a community where women observe strict *pardah* (practice of veiling and spatial separation regulated by kinship). Thus, I became privy to scrap dealers' intimate family life, which may not be explicit in the following pages but underlies all my explorations. My fluency in Hindi, having studied and spoken the language for at least 10 years by the time of fieldwork, was a source of excitement for aggregators and their families for it was for the first time that they could converse unrestricted by language boundaries with a foreigner. They never missed an opportunity to quiz me on life and everyday practices where I came from (*aapke yahaan* [your place]). Though I suspect that "where I came from" remained a source of mystery for most of my friends in the market as no one really knew where Hungary was. At one point someone assumed I was from the UAE. Another time a little girl of eight years old asked me on 15 August, India's Independence Day, if I was going to cry—that day being the day when the English lost their Indian colonies.

Chapter Plan

Each of the five chapters takes the reader through one move of a series of value transformations that are bound up in the fulfilment of EPR. Through these chapters I intend to lead the reader through the various attempts to define anthropological theories of value, which, despite many efforts, have not been possible to be brought under one umbrella term. Here, perhaps unorthodoxly, instead of privileging one theory over the others to define value, I attend to the multiple value transformations that are discoverable through each one, as they come together to give meaning to e-waste and the fulfilment of EPR in it.

Chapter One continues the discussion introduced in the introduction but places it in the twenty-first century metropolis. I situate my argument in recent arguments and conceptualisations about Delhi and tell the story of how I came to know the city. Then I explore Delhi as a site of e-waste advocacy. Moving on, the chapter presents the key demographics and characters of my thesis and presents methodology and how I navigated the city and the relations between the PRO and its aggregators.

Chapter Two examines ethnographically the origins and conceptions of e-waste as it makes its way across the country, accumulates, and takes the material form and quantities that Sahih Kaam buys up. Gabry's (2011) "natural history of electronics," meaning the way in which electronics decay and fail, provides an impetus to examine what determines the material affordances of this curious

form of waste. Here, electronics do not just break down but are aggregated into mass e-waste by Maliks, and are taken apart along the fissures of design. As electronics come apart, parts and materials are sorted to enable exchange, creating a city-wide, distributed factory shop floor. The material affordances, determined by possibilities design, of this socio-technological assemblage enables a series of value transformations between different quality scales of value, which make possible an economic activity not unlike Guyer's "marginal gains" (2004). Both the material form and its price lay the ground for the PRO, and determines the way in which it can set about its labour of transforming environmentally responsible recycling. Yet, the PRO is revealed as just another buyer in the informal value chain. Each exchange also implies a material transformation, some of which has the potential to release toxic and hazardous substances in the air, the soil, and the water around, thus contributing to the image of Kabadabad as a toxic place. The narrative of toxicity creates the grounds for establishing a threshold between informal and formal, as the ground for value transformations, despite the empirical difficulties of distinguishing between them. Through this, I link the attention to material liveliness and the narrative of toxicity to observe how these factors prepare the ground for conversion between different value scales.

Chapter Three picks up the discussion of toxicity as an issue of negative value. Negative value in anthropology has been associated with allegations of witchcraft (Guyer 2004; Graeber 2001), the contraction of timespace (Munn 1986), and the evil eye (Elyachar 2005), but tracing perceptions of toxicity ethnographically also links such discussions to caste-based substance transfers (Marriott and Inden 1977; Daniel 1984). I examine the way in which toxicity of e-waste, the informal sector, and Kabadabad appear in the professional practice and everyday banter of Sahih Kaam employees, people whose job is to spread awareness. I contrast this to the denial of Kabadabad's toxicity by scrap dealers despite their intimate engagement with toxic materials. The phenomenon is usually explained away by the lack of knowledge on the part of those working in the informal sector, but I argue that, quite on the contrary, the denial is in fact the indication of an awareness. Although modern forms of waste cannot be interpreted in the framework of ritual pollution (Corwin 2018b; Pathak 2020), in fact, the scrap dealers' denial shows a way to find a link between them. The denial is aimed at warding off toxicity's potential to devalue bodies and places. I locate negative value in those material affordances of e-waste, which have the potential to harm and turn negative, which are not dealt with in the Malik value chain but are allowed to escape. Divergent perceptions of toxicity are rooted in the embodied patterns of hierarchy in a starkly unequal city.

Chapter Four examines Sahih Kaam's attempts to establish circular economy through material arrangements of honesty. I ask what kind of practices are required to mitigate e-waste's material

potential to turn into negative value, in terms of bracketing off hazardous effluents and pollution. The chapter follows the practices that are aimed at making waste traceable, auditable, and transferable as a valued resource, with the aim of creating reliable secondary resources to be remarketed as "recycled" goods. Thus, the practices enable a redefinition of waste to replace virgin materials with the products of secondary extraction particular use value through standardisation. Moreover, material practices go further, to turn toxicity from an economic externality into the foundation of economic value. At the same time, I highlight the costs of treatment and overheads that are required in the performance of formality in the attempt to change the cosmology of e-waste in India. The exercise "to do right work [*sahih kaam karna*]" operates as a translation of environmentally responsible practices into Hindi which lack such a vocabulary. The translation highlights how environmental responsibility needs to be translated across the different spheres: corporate and informal India.

In Chapter Five, I explore relational value and the ordinalisation of relationships. I compare how numbers produce and describe relationships in the formal sector and the informal sector, to explore Sahih Kaam's question about the impact of their activities. The chapter looks at how value is made to cohere through relations: relations between companies and relations between kin, and how these relations are ordinalised in the two spheres of life that are connected through exchange. By exploring the calculations that go into establishing lasting business and kinship relations, I question what it means to make money from the e-waste exchange in terms of the ethical projects it affords. I pay attention to the Maliks' dowry practices and the nature of the PRO's relationships to their clients and aggregators, with a focus on how they create and delimit relations through numbers and regimes of ordinalisation. Maliks ordinalise their kin through the size of dowries, while the PRO, through contract and targets. At the heart of the chapter is the examination of the odd alliance between the PRO and the Maliks. The chapter makes it possible to enquire into their pursuit of values beyond economic gain and towards fashioning ethical selves, within the context of, but not bound by, historical interests in caste in South Asia.

The last two chapters trace how knowledge is circulated and withheld to determine different actors' and the individual's capacity to effect value transformations.

Chapter Six explores what it means to "have knowledge of e-waste" as it was often claimed by scrap dealers. I argue that the aim of e-waste labour is to optimise each dealer's position to effect value transformation, which requires the acquisition and retention of knowledge. This makes e-waste work a form of knowledge work more akin to artisanal practices. The circulation and

withholding of knowledge patterns the scrap trade's value chain, creating nodes to occupy for each trader.

Finally, Chapter Seven traces how the *kabadiwallas*' "knowledge of e-waste" was sought out and used by Sahih Kaam. To fulfil EPR and be able to become a successful PRO in their own definition, this "knowledge" rooted in the market encounter had to be combined with other kinds of knowledges. Sahih Kaam employees are thus revealed as belonging to a specific kind of waste workers, who are engaged in the revaluation of e-waste into environmental compliance and responsibility. Responsibility is thus the result of skilful working across different value scales, trying to work out commensurability where everyday conventions may not be present or may not even be possible. What mattered for PRO workers was to be part of a significant exercise of changing how things were done in a crucial part of the industry and putting environmental responsibility into practice. Thus, in the last two chapters, I look at the kind of knowledges that constitute work in the process of revaluing scrap into evidence that demonstrates the fulfilment of environmental responsibility.

Chapter 1 Delhi, the environment, and "bourgeois environmentalism"

My Delhi history

My interest in e-waste recycling was rooted in my long-term engagement with Delhi, one of the locations where the horrors of "informal" e-waste recycling were first documented. I had visited the capital for the first time in 2010 and returned for longer stints on two occasions during the decade. By the time of 2019, when I did the fieldwork that makes up the backbone of this research, I had become familiar with the city's enchanting and repellent quirks: its historic grace and stark contemporary inequalities; demonstrative opulence and in-your-face poverty; the trappings of socio-economic status and differential access to spaces in the city. The city's unique pattern of urbanism and urban growth, engulfing farmland on the peripheries and maintaining urban villages in the centre, was the subject of scores of publications at the beginning of the twenty-first century (Kumar 2010; Cowan 2018; Srivastava 2014). Thus, the lived experience turned into an intellectual engagement.

I started by reading Hindi and English fiction (Mohan Rakesh's *Andhere Bandh Kamre* 1961, Shweta Sharda's edited *Trickster City* 2010, Ajay Navaria's *Unclaimed Terrain* 2013, Aravind Adiga's *White Tiger* 2008), and non-academic non-fiction (Dasgupta's *Capital* 2014; Miller's *Delhi: Adventures in a Megacity* 2009; Sethi's *A Free Man* 2012); and learned how the once sleepy administrative capital had been turned into the bustling, exciting, and discriminatory metropolis of today. I read opinion posts by the city's prominent scholars on the Kafila blog (kafila.online), attended talks, documentary films, and exhibitions, too numerous to recount. I followed upon these experiences and readings by delving into the academic literature, much of which was rooted in opposition against slum clearances to make way for the Commonwealth Games of 2010 (Datta 2016; Bhan 2016). The slum clearances were a critical moment for intellectuals living and working in Delhi, which revealed the intensifying class cleavages of the liberalising economy. This came a great shock in comparison to Nehruvian era emphasis, manifested in the first Delhi Master Plans, on creating "communities of place, not kind" (Hull 2011). It was not that previous state interventions in the city had been seen as benign, the Saket sports complex ostensibly built for everyone erased the urban villages (Kumar 2010), plots handed out during Indira Gandhi's Emergency were tied to forced sterilisation (Tarlo 2001). But the claim to world class city status in the new wave of erasures to make way for infrastructure projects and the new satellite cities of Gurgaon and Noida, which

left in their wake a financialised land market, provided a great jumping board for analysis of the form of "entangled urbanism" (Srivastava 2014) that characterised Delhi in the new millennium.

The promise of "a world class city," and the slum demolitions, removal of encroachments, privatising and regularising water supply, building malls on contested lands, gave new meaning to the vocabulary of formal/informal (Hart 1973). Informal arrangements came to index low-income neighbourhoods inhabited by workers in precarious labour conditions and the livelihoods that were made in spite of the state's attempt at tighter regulations. Indeed, there is plenty of evidence that informal practices are at the heart of the Indian state and its governance practices (Roy 2009). Plenty of Delhi's higher income neighbourhoods straddle the neat conceptual distinction between planned/unplanned, legal/illegal, including access to amenities such as piped water (Birkinshaw 2017) and electricity (Coleman 2017). Renewed attempts at regulating building, planning, use of space and resources, and, not the least, environmental effluents, have not reduced the mess that characterises Delhi's urbanism. On the contrary, the continued overflow of life outside of intended form, "the leaky state" (Anand 2015), resulted in the terms informal and formal to be taken up in everyday speech. And despite much academic work to prove the contrary, the binary continues to index what Ghertner (2015) terms "rule by aesthetics." Based on stark socio-economic inequalities that pattern life in the metropolis, formal operates as nominal value judgement meaning shiny, affluent, clean and tidy, whereas informal is associated with overflowing, dirty, poor, and precarious.

The promise of "the world class city", a feature of urban regeneration world over, could not ring more ironically than when one was trying to breathe as the smog of Delhi thickened in the second decade of the twenty-first century (Spears 2019). The irony is effectively captured by the city's foremost environmental anthropologist Amita Baviskar (2020). The irony gets even deeper when we consider what Baviskar argues: although, from the early 1990s, environmental regulations had been targeting polluting and non-conforming industries according to the Delhi Master Plan's zoning laws, air pollution had in fact been largely the result of the excessive reliance by the city's affluent inhabitants navigating the city by motorised vehicles. "Delhi looks and feels like, it will further flout environmental limits that the city should by now have learned to respect. We already have a public health crisis caused in great part by vehicular pollution. The Yamuna is a flow of untreated sewage, and we get our drinking water by damming distant Himalayan rivers. Smouldering mountains of our garbage poison the air and the ground" (Baviskar 2020, 9).

The city began to feel like home to me, but the sensory experience of environmental collapse kept chasing me away, having been used to easy city commutes in my hometown Budapest and my

adopted home London (neither of the two without air pollution problems). But "[t]he social and ecological disaster that is Delhi's streetscape is impossible to escape. An avalanche of cars thunders down Delhi's roads, spitting cyclists and pedestrians out of its way. […] Each commute is an ordeal; people venture onto the road like warriors going into battle," continues Baviskar (2020, 11) evocatively. After having spent a year or so in one stretch in the city, I had to accept defeat and leave. Years later, in 2019, Salman, a scrap dealer and one of my friends and main interlocutors, expressed it so, "*yahan ka hava paani* suit *nahin karta* [the air and water don't suit one here]." The Hindi idiom alerted to the deeply conflicting atmospheric engagements that inhabitants were forced to live with in Delhi. An experience which overlaps with notions of caste, substance transfer, and ideas of belonging (Marriott 1968; Daniel 1984).

Yet, despite the engulfing smog's potential to push the affluent and poor to make common cause in the face of the "binding crisis" of waste and pollution (Doron and Jeffrey 2018), the opposite has been the case. Baviskar (2020) documents how urban environmental activism has been almost exclusively a middle-class affair, effectively redrawing the boundaries and deepening the cleavages between those who can afford to be concerned and those who cannot. "Bourgeois environmentalism" characterises the environmental movement in the city, unlike in earlier, rural movements against the damming of the Narmada or the Chipko movement. Now upper caste, middle class sensibilities define what is considered an environmental issue (Baviskar 2020). A year after the Bhopal gas leak from the Union Carbide's plant, in 1985, a smaller scale gas leak in Delhi from Shriram Foods and Fertilisers moved the sphere of environmental activism to the courts (Sharan 2014). While the litigators, such as M.C. Mehta, claimed to be working in the interest of public good, the resulting court rulings ordered the closure of hundreds of industrial units that provided livelihoods for the city's precarious workers who, due to their informal status, lost out on the stipulated compensation (Baviskar 2020). It is no accident, then, that there is no ground-up, wide-participation environmental movement in the city, Baviskar argues, except among waste pickers. The NGO Chintan organises waste pickers to run their own recycling operations. Their operations also include the collection and channeling of e-waste, effectively operating as a PRO. Waste is also one of the few causes over which middle-class and working class interests converged briefly in opposition to the Okhla waste incinerator (Demaria and Schindler 2016). The waste incinerator was built next to Sukhdev Vihar, an upper middle-class residential area, whose residents made common cause with waste pickers who found that the incinerator left them without plastic and paper, whose resale value provided their livelihoods. Incidentally, half-way through my fieldwork, I found myself renting a room in this area. However, while the questions of environmental justice and the right to the city provide a crucial backbone to my enquiry, I found

it productive to enter the question of environmentally sustainable e-waste recycling in Delhi from a different direction.

The design of markets to solve environmental issues are no less entangled with questions of value than court-based litigation. Environmentalism in the capital, unlike earlier environmental movements in rural areas, is tied to middle-class, upper-caste aesthetics. The exercise of designing new markets is not only not exempt from such value judgement but presents the success of middle-class activism to stamp its own values on what is considered ethical, responsible, and environmental. Waste, and particularly the high-value e-waste, previously a byproduct, a substance handled by precarious waste pickers, is increasingly becoming the source of value for governments and multinational corporations (Schindler and Demaria 2020). However, this is not a straightforward process but requires a series of interlinked value transformations to aid the circulation of materials, imagery, concepts, ideas, money, capital, and people in certain ways as opposed to others. In the process, it is not only that certain sections of populations have the power to define what counts as "environmental", as in Baviskar (2020), but they become determinant of how those goals are achieved, reframing value and waste in the process.

As this section has shown, the literature on Delhi has been focused on describing and understanding the great inequalities that span and structure the city. Scholarly engagement often follows interactions and alliances for political movements countering the encroachment of capital in the everyday lives of Delhiites (Srivastava 2014; Datta 2016; Bhan 2016; Baviskar 2020). In fact, many of the scholarly outputs on waste in Delhi were written by practitioners (Agarwal et al. 2006; B. Chaturvedi and Gidwani 2010; Chaturvedi and Arora 2012). From this perspective, and from the general perspective of the street, the cleavages that divide the city are combative and antagonistic. It is not an accident that the bourgeois environmentalism, and middle-class, upper-caste mentality, is often understood to be aimed at cancelling out other forms of lives and ruining other types of livelihoods. There is evidence that the humanist critique, however idealist and seemingly feeble in the face of market forces and economic gain, has been having quite an impact. Sahih Kaam's intervention in what they term "the informal sector" has been consciously framed as inclusive. While the struggle has been against the polluting practices of the informal sector in general, Sahih Kaam prides itself on engaging waste pickers and scrap dealers. Their collaboration offers an interesting case of those at the opposite ends of the social spectrum. I take the market exchange between Sahih Kaam and its aggregators as a lens, through which to think about wider processes of consumption and the transformation of values.

E-waste activism in Delhi

The question of e-waste and its impact in Delhi arose at the end of the 1990s, Satish Sinha told me in an interview, when the founder of Toxics Links, Ravi Agarwal, an artist and environmental activist, went around looking at landfills. He started producing reports for various purposes and presenting them on various platforms, including international ones, which brought him in contact with advocacy groups in the waste sphere abroad. It was these groups that reached out to ask if there were large quantities of e-waste reaching India, because it appeared from that, that India was the destination of shipments from the US. Toxics Link's research contributed to the most widely cited report by the Basel Action Network (BAN) titled "Exporting harm: high-tech thrashing of Asia" (BAN 2002). This came at a time when the number of value chains across the world were exploding, as Thiemann writes (2022). The local research results were assembled into a document that collated descriptions of conditions on the ground in different parts of the world as well as data on the toxic chemicals pent up in e-waste. The data was framed in an emotional language detailing hazard as "e-waste contains a witches' brew of chemicals." The report argued: "Market forces, if left unregulated, dictate that toxic waste will always run "downhill" on an economic path of least resistance … leav[ing] poorer peoples of the world with an untenable choice between poverty and poison—a choice that nobody should have to make" (BAN 2002, 2). The aim in the following years in the international arena had been to push the US to honour the terms of the Basel Convention of 1989, which prohibited the transboundary movement of hazardous substances between OECD and non-OECD countries. However, as Lepawsky (2018) writes, the enforcement of the convention in relation to e-waste ran into multiple impediments, for much of e-waste is exported legally as working-order, second-hand electronics. Still, the harrowing imagery and narrative about toxic wastelands in Asia, produced by Toxics Link, was effective in mobilising researchers, activists, journalists across the world and the images spread on the web and in numerous documentaries. This laid the foundation for the narrative around e-waste for the next two decades.

A year after the BAN report, Toxics Link produced their own report titled "Scrapping the high-tech myth" (Toxics Link 2003). The document provided an in-depth description of the market in second-hand electronics and scrap in Delhi, based on a thorough survey of various locations in the North-Eastern peripheries of the Indian capital. Similarly influential as its international counterpart, the report and articles published in more scholarly publications (Agarwal et al. 2006) were used to launch a successful international lobby against Dell, the computer hardware and peripherals manufacturer, to force them to take responsibility for the end-of-life electronics (Pellow 2006). At the same time, the material assembled helped Toxics Link to push for a national

legislation, in which they found allies in international NGOs and sympathetic politicians. As Mr Sinha told me, they drafted the 2011 e-waste rules and then the 2016 ones, based on the EU and the Japanese examples. Their draft was presented in parliament and accepted with minor modifications, meaning that they were instrumental in introducing the concept of EPR to India.

While they worked on other projects, too, in the meantime, campaigning for a legislation on lead in paint for example, they continued to produce reports on e-waste. At the time of our interview, Mr Sinha was working on designing a recycling plant for the government of Goa, a Southern state, and working on tenders to be floated to fund and run the factory once the Goan government allocated land for it. Looking at the recycling plant floor plan, I was struck by how different this endeavour sounded from what I imagined environmental advocacy groups do. I asked him how the discussion shifted from an environmental concern to that of a business case.

> "This is something that I also don't understand, this has become a business thing only. Now, I also find that many meetings that I go to … I don't hear anything about the environment. Sometimes I get lost as to where I am sitting!"

In tacit acknowledgement that the shift had indeed happened, he continued detailing the need to raise money for proper e-waste disposal by making the consumer pay. And if the consumer could not be made to pay, the money would have to be raised in other ways, EPR an important policy tool to the industry. The exchange with Mr Sinha throws into question whether the EPR was intended to institute a new market in e-waste from the start, but it also shows how by now the financialisation of waste management and the need to recoup value directly from waste had become an all-pervasive idea.

Around the time I met Mr Sinha, they were about to release a report on the status of the informal sector after the 2016 Rules. The report detailed how the recent changes in legislation did not stop e-waste from flowing to the informal sector, where e-waste is taken apart without proper machines and protective equipment. At the same time, Mr Sinha expressed a worry that it would unleash another "sealing drive" in the area, asking me whether I had noticed anything. Sealing drives had become the modus operandi of environmentalism from the end of the 1990s, when activist-litigation directed by M.C. Mehta led to the drive to close polluting and non-conforming industrial units in Delhi (Baviskar 2020). From my rambles in the e-waste markets in North-East Delhi, I had found that sealing was in fact less permanent than many of the accounts make it out to be, and more a constant annoyance and back-and-forth game between warehouse owners and the authorities. Police would turn up in Kabadabad regularly and close a few shops that they find open, sealing them, which means owners do not have access to their wares unless they manage to bargain

for a price to reopen them. The ease with which this is done usually depends on where the order is coming from. When it is just the local police amusing themselves, it is fairly easy to get one's unit back, but when the Supreme Court or, more recently, the National Green Tribunal (NGT) are involved, sealing means losing one's stocks and tools that are in the shop at the time. The sealing drive is then preceded by a flurry of activity to close shops and remove all wares spilling out on the roads as the news spread of the police's approach. There were stories of another e-waste market where, after a "sealing drive" that shut down many of the units, the local business owners got together and contributed towards fines for those who needed it. If one has no money or bargaining power, they just count their losses and move down a couple of houses or streets, to open up another unit. However, as Mr Sinha fears, there is a clear connection between "bourgeois environmentalism" and "sealing drives." The first time I went to one of the e-waste markets on my own initiative, unaided by introductions from Sahih Kaam, I was not surprisingly mistaken for a *mediawalla*, someone from the media. I was told that no one would talk to me, since every time someone comes down to shoot footage, pictures, or make interviews, a sealing drive follows.

Demography and key characters

Sahih Kaam is an organisation that sits firmly in the corporate sector. As a startup, it represents corporate India Shining that has come under considerable criticism from cultural and political commentators as exemplified by the public intellectual Arundhati Roy (2009). The startup, with its office location in Gurugram (formerly Gurgaon), Delhi's financial satellite city, represents middle-class, upper-caste aspirations of a well-functioning public sector. Most employees of Sahih Kaam come from the new, Hindu middle class and upper castes (Fernandes 2000). These are sections of society who are often seen as the beneficiaries of India's liberalisation. The Bharatiya Janata Party (BJP), led by Narendra Modi, the former chief minister of Gujarat, came to power on the will of the new middle classes for development. The lack of development was seen contradicting the pride taken in India's IT boom and aspirations of global economic significance. Banking on the IT boom, this segment of society increasingly believes that corporate practices, transparency, audit cultures, and doing away with bureaucracy, can solve what they see as India's developmental problems, including that of infrastructure (Dasgupta 2015). Despite such an orientation of the new middle classes, Sahih Kaam employees were more heterogenous in their political outlook. However, the corporate sector attitude and increasing sphere of influence leave its mark on the sense of the public good (Bear and Mathur 2015) and, as an extension, on what is considered environmentally sustainable and ethical.

The first thing that greeted me in Sahih Kaam's bright yellow-decorated shiny office, was a bunch of recent graduates from my alma mater at Central European University, Budapest. They were from among the new, globally mobile young unmarried, mostly female, workforce, originally from Delhi, who wanted to do with their life something that mattered for the environment. Even those who did not go abroad had done environmental science, engineering degrees or MBAs in India's top universities. They performed the front-facing tasks of the "awareness team," "producer team" and the "BD team" (business development).

The BD team liaised with producer brand partners, approaching them to sign up for Sahih Kaam's services. Their members overlapped with the producer team that was responsible for handling client accounts, sorting EPR compliance documents, keeping in touch with the relevant government departments, the CPCB (Central Pollution Control Board) and SPCBs (State Pollution Control Boards), and auditing the internal compliance processes. It was also the producer team that established and maintained the e-waste bins and collection points that were put up across India as a legal requirement. The awareness team developed the impressive school awareness curriculum in accordance with Sustainable Development Goals (SDGs) and organised its delivery. They trained trainers to teach courses and deliver awareness workshops at different levels, schools, universities, bulk consumers. The time I joined them, they were trying to widen their reach through residents welfare associations (RWAs), that most infamous of Delhi institutions, which held no executive power and yet regulated so much of life and access to space in the capital's landscape of gated communities (Schindler 2017; 2014; Srivastava 2014). Employees working in these teams represented the company at events and trade fairs, helped organise events like the one described in the beginning of this introduction. They all conversed in English or the unique Hinglish that has become the lingua franca of India in the twenty-first century, only relapsing into Hindi occasionally and to talk to service staff (Orsini 2015; Hall 2021). In fact, many of them disliked the government and Modi's second win in the 2019 elections. Under their breath they sometimes indicated that Satkar, the founder whom they all liked and respected and jokingly called "sethji" (boss and a caste name for a baniya), was more in line with the developmentarist attitude of the corporate sector. The workers, however, were secular, liberal with their food and drinking practices, liked to chat about a wide range of topics. Caste was not an issue they mentioned much, but when it did come up, they were broadly from different upper castes. I found very generous hosts in them, with whom I could share much, including my non-Brahminical food, free banter, and an occasional drink.

The other constituency in the office was no less middle-class, but of a different kind belonging to what is sometimes indexed by India's Hindi name, Bharat. They knew quite a bit of English but

mainly used Hindi to talk to each other and were often from states other than Delhi. They were termed the "operations team" and sat together at the far end of the open plan office in executive type chairs by a common desk that gave out the air of important technical work. This was a group harder to penetrate for me, since they were all men, giving off a gruff air and looking at me with suspicion. I termed them "heavy lifters" as they were responsible for keeping e-waste flowing, sourcing e-waste, working closely with aggregators, and deciding on pricing and categories of waste to be picked up. They were responsible for running warehouses, doubling up as e-waste collection points in all states, managing logistics (which was outsourced to another company), and making sure in all ways that the targets were met in material form. As I got to know them later, many of them, though not all, were brahmins and rajputs from Rajasthan and proud of their backgrounds. They were also more often married than members of the previous demography. The man I call Amit was responsible for the 400 plus trucks that kept plying the country at any given moment. He was liberal in his drinking but had more traditional family arrangements with his wife and children back in his hometown with his parents, while he lived the life of a bachelor in the city. One of the reasons why it took me a little longer to engage with this crowd, despite my decided interest in their relationship to the aggregators, was because they often went out separately from the English medium Delhiite colleagues. I was never told directly what kept them apart but was made to understand that going out together was not preferred by either group. This proved a small challenge for the two male colleagues who, given their gender and job roles found it easier to move between the two groups. On days when both groups went out it was a hard decision who they would like to hang out with. The team also had two colleagues based in the northeast Delhi warehouse, Manish and Kartik. With little English and few office tasks they were at the bottom of the startup's unarticulated pecking order. One was a devout Hindu and often exhibited annoyance at the Muslim Maliks, the next demographic on the list, while the other became best friends with them, often even sharing with them his free time.

The third demographic central to my thesis were the aggregators who sold e-waste to the operations team in bulk. In the thesis I usually use the more neutral term "scrap dealers", when I talk about them generally. Aggregators is a term used by Sahih Kaam to index the kind of service they provide for the company, but the terminology also completes the company's claim to have "formalised" them. They, on the other hand, mostly refer to themselves in the Hindi term *kabadiwalla*, which roughly translates as scrap dealer, *kabad* meaning recoverable waste, and *–walla* being the Hindi suffix meaning occupation or carrier of a certain trade. They refer to their work as *kabade ka kaam* (scrap work). I met Sahih Kaam's aggregators for the first time when I followed Satishji (-ji is the Hindi honorific suffix that was only used for his name and another more senior

member nearing retirement) to Kabadabad for a health and safety workshop held by the International Labour Organisation (ILO). In comparison to the aggregators, Satishji's gruffness that I observed among the "heavy lifters" disappeared, his *shuddh* (clean) Hindi adding to the effect of his well-mannered air. Yet, interestingly, many of the aggregators also talked of themselves as *aam aadmi* (average man), which came to index middle classness especially following the Aam Aadmi Party's rise to power in the Delhi Legislative Assembly. Most aggregators were Muslims from the Malik caste from Western Uttar Pradesh, invariably citing Meerut as their home city, who used to be *teli*s or oil pressers by caste and occupation. They speak Hindi in a western UP accent that they would inflect to make it more understandable for me to. They were defined as middle-sized businesses to the ILO representative in a health and safety workshop I attended. Most scrap dealers had 6-12 years of schooling, with one of my main interlocutors and friends Shaheed having started a college degree in business, only to leave it for informal scrap work. Another close friend, Mohsin, put himself through college to become a criminal lawyer, but thought there was more money to be made in recycling. He now runs a registered dismantling and recycling company receiving e-waste from Sahih Kaam.

The demography seems an important point of departure. I started my fieldwork at the end of Modi's fifth year in office, a period which has not been kind to the Muslim populace. In the first couple of years of the BJP's reign there were a series of lynching related to accusations of Muslims killing and selling cows. Just around the time my fieldwork ended on 12 December 2019, the Citizenship Amendment Act (CAA) was enacted, which sparked widespread protests causing considerable anxiety among my interlocutors. The CAA changed the procedure of acquiring citizenship for "illegal migrants" hailing from India's neighbours, allowing those from Jain, Hindu, Buddhist, Christian, Jain, Parsi backgrounds to apply after a period of 11 years spent in India. Muslims were not granted this right. Coming at the tail end of the Rohingya crisis, the omission of Muslims from the list of those eligible to apply for citizenship allowed this legislation to be interpreted as an anti-Muslim law. On top of the obvious discrimination on religious grounds, the fear was that, paired with the implementation of the National Register of Citizens (NRC), it would be possible to divest millions of Indian Muslims of their citizenship. The NRC has already been implemented in Assam, sending people without the required proofs of citizenship to camps, and the government had announced plans to implement it in the rest of the country. This would have affected many of the *kabadiwalla* families who, having left their *gao* (village), or place of origin, would find it hard and arduous to go back to obtain the necessary documents to prove that they, and their forefathers, had been residents in the country. At around the time I left the field, there were regular protests on the streets of Kabadabad. Many of my *kabadiwalla* friends would call me

on WhatsApp with the shouts and images of the protests drowning out our conversations. In the Sahih Kaam office, there appeared to be little understanding or sympathy for the protests that were brutally squashed across the city. On 23 February 2020, only a couple of months after I had already left the field, several neighbourhoods across northeast Delhi in the vicinity of Kabadabad were shaken by anti-Muslim riots that went on for six days as the police stood by.

Although each demographic defines themselves as middle class (everyone nowadays claims to be middle class, as Sanjay Srivastava said in his keynote at the RC21 conference held in Delhi in 2019), those working in the Sahih Kaam office are worlds apart from those working at the other end of the city in the warehouse and the scrap market. The latter, because of their association with the sprawling settlement patterns and poorer infrastructure provisions of lower-income Delhi, are often equated with informality and the urban poor. Their work in the waste sector, a traditionally polluting industry, convinces academics and policy makers of the poverty of these sections of society. Yet, while the former two demographics are considered part of formal Delhi, that is corporate India, they have only marginally better claims to job security than do the scrap dealers. Though income structures and benefits differ and provide for radically different lifestyles, in some cases I was not sure whether scrap dealers, or at least some of them, were not earning as much or higher amounts through their business than Sahih Kaam employees. Sure, the company offered a health insurance package and pensions, and while self-employed scrap dealers may have taken care of that themselves, their access to healthcare was much more limited. Hospitals were miles away from Kabadabad and accessible through bad, potholed roads that were either submerged by a mix of sewage and rainwater, or when the weather was dry the road suffocated passengers with particulate matter in the air. The experience of arriving to and leaving Kabadabad was not unlike on the worst of dirt roads up in the Himalayas.

Methodology

All that is left to be explained is how I navigated the city during my fieldwork year. The PRO was an obvious choice to start from because they had an encompassing view of the issue of e-waste, which is why for the first 3–4 months I visited the Sahih Kaam office every day. Once I was familiar with what went on in office, I began to follow employees when they went to "the field." The first trips led to the warehouse of Sahih Kaam in the north of Delhi, situated close to Kabadabad. My first trip to Kabadabad was also to attend an event organised by the PRO, where I first met my scrap dealer interlocutors, some of whom became friends later. However, once I became familiar with company employees on the ground, I began to visit the warehouse on my own, where Manish, the field executive of Sahih Kaam who will become familiar from the next

pages, was especially welcoming. He explained in detail what went on in the warehouse and promised to show me around in the market. It is through his intervention that I came to Shaheed's and Mohammad's place, whose two warehouses became my main sites in Kabadabad. Shaheed and Mohammad were obvious choices, because they had been the aggregators who worked most closely with Sahih Kaam.

Shaheed immediately opened his warehouse to me and introduced me to his family, where I was a welcome guest until the pork incident detailed in chapter 2. Parallel to that, I was getting to know Mahmood's family better. I came to know Mahmood from the market through Manish, but in time got better relations with his elder brother Mohsin on account of his formal dismantling plant. I got to know Mohsin not through his brother but through Amit, my closest interlocutor and friend in Sahih Kaam's operations team, when he went to audit Mohsin's newly opened dismantling plant. These relations draw the map of my fieldsite because the introductions created its extent and drew its boundaries. At one point or another, I tried to extend my reach to other scrap dealers who did not sell to Sahih Kaam, but my efforts were unsuccessful. Eventually, Shaheed explained to me that they did not want me to make friends with others, because I would have connected them to the company and that would have meant competition for them. Similarly, Mahmood took me to a cousin of his who was in the line of blowtorching motherboards and shaking the components off the board. The unit had a room where 5–6 women sitting on the floor were sorting the components according to copper, gold, etc., the main metal to be extracted from each motherboard and deciding whether they went for recycling or refurbishing. These encounters showed me the limitations of my approach to study e-waste recycling through the lens of Sahih Kaam. In fact, in Kabadabad I was never free from my association with the company and, thus, I did not have the experience many anthropologists prize: the unencumbered and unmediated access to "the native's point of view."

My taking up residence in Kabadabad in the fifth month of my fieldwork did not bring much change in this regard. I did not notice any change in the behaviour of the *kabadiwallas* towards me in the sense of more honesty or openness. It may have to do with the fact that there was no occasion when I could really make clear my separation from the PRO. I also did not stay continuously in my room in Kabadabad, as I commuted between my South Delhi residence which I continued to rent with my partner at the time. This meant that I often disappeared for many days at a time, making my presence in the e-waste market patchy. Having a room in the area did help me in many ways, as did also the fact that I continued to go back to my partner's place, however counterintuitive that may sound. For in the beginning, when looking for a room, I took my partner along with me to introduce himself and to see the room with me. I introduced him as my husband,

which I understood to correspond loosely to a committed relationship, and that gave me an unambiguous status in the eyes of Kabadabad residents, a tight knit Muslim community where women do not go out of the house much, let alone work. My ways were strange for them, but having a partner allowed them to put it down to strange foreigner ways, they did not become cause to question my morals, something that I was aware could have opened up advances of the kinds I was not particularly looking forward to receiving.

The idea about setting up my fieldwork between PRO and scrap dealers, while limiting in some sense, also became a device of inquiry. My approach through the PRO provided an easy and evident way into Kabadabad market, without having to force anything, leading to connections that would have been impossible had I just arrived unintroduced and started wandering around the market. This is the oft-practiced way in which ethnographers arrive in lower income fieldsites in Delhi, while living in comfortable middle-class localities, which seemed impracticable for me. All the more so, because the e-waste market, due to two decades of bad press and the frequent sealing drive of the police, is not an especially welcoming place for an outsider, let alone a foreign woman like me. I had tried to strike up conversation in other e-waste markets, but no one wanted to talk to me and those who did resisted through jokes that made me uncomfortable. During my time roaming the streets, no one approached me to talk to me, which was striking in light of my experiences elsewhere in the city, where I would get into regular conversations with shopkeepers, auto-drivers, or just anyone. This may have to do with the fact that news travelled fast in Kabadabad and the one about me that did the rounds was that I came to close down the market. Understandably this threat was stronger than the curiosity anyone might have felt to approach me. Yet, my connection with Shaheed and Mahmood and their families gave me reason to be in this part of the city.

In the beginning, to overcome the awkwardness, I hired Varun, an ex-Sahih Kaam employee who had just quit his job in preparation to go abroad for his masters in environmental science but had some months to spare. Varun's presence also cemented my association with Sahih Kaam in the eyes of scrap dealers, but also allowed me to explore some aspects of formal e-waste recycling in detail. When Varun and I started hanging out in Kabadabad, Mahmood and his partner Parvez were conspiring to set up a recycling plant together. However, in the end, Parvez decided to quit the partnership and the main job of setting up the plant was handed over to Mahmood's brother Mohsin. With Varun's presence promising an added avenue of being heard by Sahih Kaam, we found ourselves at the centre of attention. While not much of the negotiations and scheming made it into the current thesis, the resulting discussions gave me a better understanding of what was at stake in the relationship between the PRO and its aggregators. At the same time, the period spent

roaming the streets with Varun is invaluable in receiving feedback on my first attempts at analysing what is going on in the e-waste industry in Delhi.

Chapter 2 The price of e-waste: "Elephant for 1 lakh, a dead one for 1 and quarter lakh rupees"[5]

In January 2019, just before starting fieldwork in Sahih Kaam's office, I took a trip with friends to Srinagar, the capital of Kashmir and got stuck due to extreme weather conditions. To make up for the lost time in beginning my fieldwork I strolled down to the local scrap shop. On that day, I observed the usual activities of scrap dealers bringing their wares, the weighing of items, the people who came to look through a concatenation of discarded items, old radios, popcorn maker, a gas lamp. Someone brought a car battery that the scrap dealer carefully emptied of its acid contents into the open drain before putting it on the scales and buying it for 760 rupees, a piece weighing more than 10 kilos. Plastic was sold at 11 rupees, aluminium at 74 rupees, brass at 200, and copper at 400 rupees a kilo. Another person was burning the oil off a car oil filter. As we chatted, the shopkeeper told me about how once a month he would fill a *gadi*, a lorry, worth a few lakh rupees and send it off to his trusted buyer in Mundka, Delhi's infamous plastics market. The load would be made up of all types of scrap, including plastic and electronic waste, the waste fractions that have no immediate market locally.

The movement of waste from the scrap shop in Kashmir to Delhi's biggest plastic market illustrates well several points that this chapter is aiming to make. The scrap shop is the point where waste enters India's waste collection infrastructure, this is also the place where e-waste originates. Activities in the scrap shop illuminate how most wastes in India never reach zero waste but are exchanged for money even when consumers discard them. The scrap shop is also the first point of aggregation, through which the individual battery or a popcorn maker becomes mass waste. Once the truck from Kashmir reaches Mundka, its load merges with loads from other parts of the country and one popcorn maker becomes many, and the economies of scale increase the resale value of the different fractions that would result from once it is broken apart.

My interest does not lie in the popcorn maker, but rather in the process of aggregation and attrition that creates value in the value chain. This result is not the kind of entangled, soiled, irretrievably mixed mass waste that countries with a better reputed waste management systems create (Reno 2016). For despite its heterogeneity, the material intended for the Delhi market is categorised, sorted, and precisely priced in a way that its recipient can further separate it and sell the fractions to specialised sellers. The scrap shop is but one way in which e-waste enters the waste management

[5] A lakh is the number word used in India to denote a hundred thousand and is written 1,00,000.

system and perhaps not even the most important one, as it will emerge from the following pages. But this demonstrates the main characteristics of e-waste as heterogeneous, piecemeal, and dependent on the flow of small quantities aggregated in regional outposts to centrally located markets through a series of market exchanges. The Kashmiri scrap dealer explained that once he pays for the scrap and the transport, he is left with a profit of five to six percent, a small profit given the high price of the scrap load.

Thus, this chapter traces the origins of e-waste and its movement across the subcontinent in India's waste management system, where waste is moved, transformed, valued, and priced at each exchange. The sorting, aggregation, and geographical movement each offer thresholds across value scales that the scrap dealer uses for "marginal gains" (Guyer 2004). This chapter sets up the most fundamental problem at the heart of making e-waste recycling responsible—the price of waste. Since e-waste does not get discarded but rather sold to scrap dealers at the point of entry into the waste stream it continues its life as a commodity, never quite reaching the state of indeterminacy that creates the grounds for revaluation (Thompson 2017; Reno 2016; Alexander and Sanchez 2018). Moreover, e-waste has a dispersed materiality due to the patterns of pre-discard electronics use in homes and offices, which make collections a cost-intensive exercise in the emerging formal value chain. In this chapter, I introduce the Maliks as the Muslim caste who operate the most efficient logistics network to aggregate and channel e-waste. The market of Maliks in northeast Delhi becomes one of the most significant sources for e-waste sorted and assembled in quantities which are required for the fulfilment of targets. However, the different ways in which e-waste is counted in each sphere creates problems for getting the price of e-waste right.

In the market, electronics are broken down into scrap through the economic transactions, while passing from one hand to another in circuits of scrap, accelerating the process of material attrition, which has been causing global anxiety about the toxic effects of rising electronics consumption.

Origins of e-waste

The informal market

The main obstacle to the smooth implementation of EPR, which was widely identified, was the lack of signs that "informal sector" activities would be waning due the introduction of the Rules (Toxics Link 2019). Toxics Link's report is based on a survey conducted in e-waste scrap markets in northeast Delhi after almost two decades of their first report in 2003 and two years after the E-waste (Management) Rules of 2016 came into effect. They found that there was an equally vibrant trade of computer scrap as on the previous occasion, even if it appears that volumes had decreased

despite official predictions to the contrary. This raises the question of how e-waste flows are understood and counted. I follow my interlocutors' use of terminology, calling the continued buying and selling of e-waste by small-scale enterprises outside of regulatory control "the informal sector."

The resilience of the informal sector is usually explained away by economic reasons. The argument goes that given the informal sector's disregard for environmental laws and labour protection, it is cheaper to recycle without investing in protective equipment and machines. In addition, the economic growth after India's economic liberalisation was not matched by job creation in the formal sector, thus producing a "reserve army of labour" (Gill 2009). Sections of society, left out of the benefits of India's economic growth, are willing to take up jobs without any thought for the risks entailed (Gill 2009). The informal sector can recover value from e-waste more efficiently, because people, in pursuit of profits, have no qualms about repurposing materials which would otherwise have to be taken out of production. At Sahih Kaam, this argument was often illustrated through the example of the CRT (cathode ray tube) monitor. By the nature of its composition, the CRT monitor is the perfect example to demonstrate the hazard and value of e-waste, as the value recoverable from the electronic gun containing copper is balanced out by the treatment cost of leaded glass. For leaded glass according to regulations is to be buried in TSDF (treatment, storage, disposal facilities) requiring payment. The same glass, however, is recovered in the market and remade into other items without concern for the detrimental effects on environment and workers' bodies.

While the threat of electronics ending up at the landfill is used widely as reason to support the reform of e-waste recycling, there is little evidence that much e-waste is thrown away. In fact, post-consumer electronics rarely reach that ultimate state of indeterminacy. Rather, at the moment of discarding, electronics items enter into complex gift and market exchanges. Individual consumers pass down used electronics to younger siblings, wives, and household help. Households are world over repositories of obsolete information technology products kept piling up on top of wardrobes and in drawers eternally. In India, the best solution is to sell to the *kabadiwallas* (scrap dealers), the hawkers who plie the streets on bicycles buying up household scrap: cardboard, glass, and other valuable waste. The hawkers then pass their wares onto scrap shops, such as the one in the opening paragraph, from where materials aggregated piecemeal make their way to specialised dealers, who pass it on to the next person. Scrap shops are sites of some amount of dismantling, but obsolete electronics make their way through the value chain into markets in northeast Delhi.

The bulk of e-waste originates not in the household but in public and private sector offices. According to an old figure by the government of India, 70 percent of e-waste is produced by private and public sector offices (Rajya Sabha 2011). The legal framework forces bulk consumers to get rid of their waste through online auctions through a central website, where recycling companies and *kabadiwallas* with official registration can bid for wares. Much of these discards are a mixed lot but can be refurbished and resold as used working order electronics, making the price of bulk consumer loads very high. Corwin (2020) recounted the Italian e-waste buyer's shock in India at the high prices compared to his low expectations of a country where e-waste is "dumped." My interest in the price was also piqued by the fact that much of the literature on the scrap trade linked the value of e-waste to global metal markets (Corwin 2018a; 2020; Lepawsky and Billah 2011). However, there is more to the value of e-waste than what meets the eye and price offers the lens through which these are revealed. "Prices are ciphers for a complex entanglement of actors, relations, ideologies, things, and environments" (Luetchford and Orlando 2019). Thus, I take the price of e-waste as a cipher for the relationships that cause e-waste, a fragmented and hybrid waste, to be assembled in quantities and sorted by kind, which makes it possible for Sahih Kaam to fulfil producer targets.

Prior to my arrival, I had learned that Muslims operate the informal market. However, it was not until I started spending more time in the e-waste market that I noticed that all the aggregators' second names were Malik. One day when I was left alone with Mahmood and Mohsin's brother Mahir, the middle brother, a law and history graduate, we chatted about education and his plans to perhaps study further in history. He began to tell me how he benefitted from reservations and how highly he regarded Babasaheb Ambedkar (1891–1956), the chairman of the constitution drafting committee and the champion of low caste politics, of low-caste origin and a lawyer.[6] When I began to prod further, he explained that buying and selling used electronics and scrap is the domain of the Maliks, a caste of Muslim *telis* from Western UP from around Meerut.[7] Maliks claim

[6] B.R. Ambedkar was born into the mahar caste in Maharashtra and was one of the first untouchables to gain education. He studied at Columbia University and at the London School of Economics and was called to the bar in London. He spent his life fighting for the political emancipation of India's untouchables and the *Annihilation of Caste* (Ambedkar [1936] 2014). As a result of his campaigns, independent India adopted a scheme of positive discrimination of reserved seats in government institutions and political representation for the Scheduled Castes and Scheduled Tribes (SCST). This scheme was extended to include OBCs (Other Backward Castes) at the recommendation of the Mandal Commission in the 1980s (Jaffrelot 2003).

[7] Although caste is usually considered to be a Hindu form of social hierarchy, this claim has been the subject of intense debates in South Asian scholarship (Guha 2013). The institution of caste as commensality and endogamy is also a feature of South Asian Muslim societies, despite Islam being a fundamentally egalitarian religion (Ahmad 2018; Lee 2018). Maliks are OBCs (Other Backward Castes). The category includes a varied selection of mostly Hindu castes, but some Muslim castes, such as the Maliks, had also gained recognition of their disadvantaged status. As a result of this recognition, 27 percent of educational seats and government employment has been reserved for

to control much of the e-waste trade and the primary dismantling processes (see also Rathore 2020). After this encounter, I heard repeatedly the claim, "*Malikon ne yeh line pakda liya*, [the Maliks grabbed this line (of trade)]." The trade likely started about twenty-thirty years ago through trading in small electronic items, radios, and household goods, as Rathore argues. Though the beginnings are hazy, it is likely that Maliks started by dealing in generic *kabad*, all sorts of second-hand items including consumer electronics before they began to specialise. The *telis* were originally oil pressers by caste occupation, but they turned to other sources of livelihood when the profession became less lucrative. However, not all interlocutors had family histories of oil related work. For example, Shaheed and Samir's father used to be a hawker of cloth that he sold off his bike, riding around Meerut. Shaheed and Samir's warehouse, situated at the centre of Kabadabad market, where they broke CD-ROM players and keyboards, became an important field site for me, where I spent many hours observing the dismantling, and chatting about the vicissitudes of the e-waste trade.

Following the networks of the trade, Maliks continued their specialisation, leading to a vigorous and specialised trade in e-waste. The caste followed a particular migration pattern from Meerut, a town barely 50 kms from Delhi, to settling in several neighbourhoods across northeast Delhi. They live in the areas which were identified as the e-waste markets already in 2003, of which Seelampur became the most visible, making headlines regularly since. However, migration has not been straightforward, for between Meerut and Delhi, younger men in the family would be sent out to smaller regional centres at the start of their career. Some end up settling in regional centres, effectively operating an all-India collection system whose strands run together in Delhi. The *biradari*[8] operates through a defined division of labour, where *pheri-phere* or hawker Maliks specialise in collecting waste from scrap shops or *kabade ki dukaan*. Mohsin's sister-in-law was married to a *kabadiwalla* who settled far down south in Kerala. I met a young man, Haroon, who was about to leave for Puri in Orissa, where his family sent him to buy up computer scrap for half the price (keyboards cost 15 rupees, half the price in Kabadabad). Other *pheri-phere* Maliks would specialise in buying up the scrap originating from auctions from private sector offices and government institutions. Another, contentious source of e-waste are the recycling plants which have been known to sell e-waste in bulk (Kandhari and Sood 2010). Though these activities are termed

members of castes that have been categorised as OBCs. The castes have been included based on social and educational disadvantage as compared to the upper castes. However, the experience of OBCs with caste discrimination is uneven. They had gained political power in what Jaffrelot calls "the silent revolution" (Jaffrelot 2003). In some parts of India, the OBC category includes dominant caste Hindu landlords who are responsible for the most egregious caste violence (Teltumbde 2010). Yet, Muslim OBCs had benefitted less from political power and land ownership. The various commissions determining OBC status had found that Muslims are "the most backward community despite their rich cultural heritage and strong numerical presence" (Jafri 2022, 448).

[8] *Biradari* means brotherhood, but is used interchangeably for caste among Muslims (Ahmad 2018; Lee 2018).

informal sector, yet, *kabadiwallas* now hold licences to trade legally in e-waste. Once a truck is full, it is sent to Delhi, where they have their regular contacts to pass their wares (*maal*) or let the back hatches of their trucks down in the open space of the *khatta*[9] and wait for smaller scrap dealers, such as Shaheed, to come and pore over the *maal*.

Through this trade, buying and selling, quantities are assembled—one and two pieces here and there in *kabade ki dukaan*'s across the city and the country become many in the hands of the Kabadabad's *kabadiwallas*. The e-waste trade effects "kinetic counting" (Guyer 2004, 56), where items are added to each other piece by piece, to create out of the singularity of used electronics a plurality of *maal* which become singularity again as a sack or truck full of printers, CRT monitors, CPUs, CD-ROM players. Nelson cites Verran (Nelson 2015, 83) saying that "doing number is 'doing the relation one-to-many'," meaning recursive switches between singularities and pluralities to quantify waste. However, parallel to the kinetic counting of the trade, another process of dismantling unfolds, breaking items down from whole into waste fractions, steel, plastic, PCBs, motors, aluminium, rubber, glass. This is a process of further attrition into ever smaller singularities that make up ever more homogenous fractions which can be sold further.

Through processes of assembly and growth of quantities and material conversions, each exchange brings a marginal gain added on top of the price for which it was purchased (Guyer 2004). Guyer's concept of marginal gains, based on rich empirical material of exchanges in Atlantic Africa, provides an effective framework to think of the transactions that lead to material attrition in e-waste (Guyer 2004). She is interested in monetary transactions and concomitant value transformations in economies, where the state's regulations are only tangentially effective in standardising market transactions. In Atlantic Africa, money issued by the state usually does not return to its ambit, but enters into a complex set of value scales with other media of exchange. This means that transactions and the mediation of the different value scales are not imposed through the authority of the state. Thus, Guyer's concept of marginal gains builds on the multiple meanings of the word "margin," to indicate the location of markets in the margins of global financial markets, at the interface between Africa and Europe, as well as to indicate the small margins that are built into value conversions between the different scales of value that emerge in these spheres. While Guyer's interest remains focused on money, exchange, and scales, I draw on the collateral materiality of her theory of exchange to think further about the material effects of the various exchanges in e-waste in the absence of regulatory frameworks. Or, when there are

[9] *Khatta* is the large open space in Kabadabad that operated as a municipal solid waste dumping ground and the place where trucks full of e-waste were stationed and sell their wares in an open market.

applicable legislations, they continue to be carried out on the margins of these. Money as the price of e-waste appears as a method of commensuration, an indicative of material obsolescence as it is enacted in circuits of scrap.

Kabadabad is marginal in a sense similar to the way Guyer understands Atlantic Africa. The earliest commentators emphasised the absurd link that exists between the global marketplace and the 'derelict' neighbourhoods of old Delhi, 'where phones and computers came to die' (Chintan, Silicon Valley Toxics Coalition, and Arjun Bhagat n.d.). With the caveat that phones, computers or, for that matter, any other electronic item did not come to die, but to be bought and sold and in the process taken apart to be revalued. Kabadabad is also found on the margins of the Indian capital forming an internal borderland of the state, where the state does not impose a universal standard of valuation and rationality. The different thresholds between value scales and materials' crossing through them does not only hold potential for value transformation but is also the entry point for a citywide recycling industry with very material repercussions.

Marginal gains are also made through transactions crossing thresholds other than geographic ones. There are gains to be made through transactions between different spheres, currencies, units of measurements, between various nominal and ordinal scales, etc. In the case of e-waste, given the lack of regulations extending to all aspects of the trade and much of it lying outside regulations, there are margins to be made through manipulating thresholds. The category waste already means a threshold that is crossed between objects sold as commodities and waste that lies around waiting to be revalued (Alexander and Sanchez 2018; Reno 2009; Thompson [1979] 2017; O'Hare 2017).

As Aman, a buyer who came to pick out *challu* (working order) keyboards from Shaheed's scrap shop expressed: "It is the lack of regulations that allows for this trade to continue. The recyclers sell it to Shaheed, after they had bought it from government agencies for 5 rupees. They make a profit on it, Shaheed makes a profit on it. I also make a profit on it. *Sab khate hai. Is mein kisi ki bhalai nahin hai* [Everyone eats. No one benefits from it]. If there was a regulation, I wouldn't do it. I would do something else." The man's tirade presents the widespread belief that recyclers sold *maal* straight to recyclers like Shaheed, but although this was generally true it did not apply in Shaheed's case. At the same time, this discourse confirmed the sense of materials in circulation and the incremental gains made through such circulations. *Maal* was bought and then resold, at every step of the way people made profit or eaten profit. *Paisa khana* or eating money is often used as an idiom of corruption in Hindi (Mathur 2017), which here gives a tint of illicit nature to the trade in e-waste. *Paisa khana*, illicit profits are contrasted to *bhalai* meaning benefit in a moral sense, indicating the widely perceived, generalised harm of the activities. Everyone, including Aman, took

part in making gains from materials exchanging hands and crossing thresholds. Aman, for example, by engaging with Shaheed could buy keyboards at scrap prices and then, would do some refurbishing, replacing missing keys, and sell them as *challu*. This was detrimental to society as a whole, he judged, unaware of arguments to the contrary that he was performing environmental labour by extending the life of items built for quick obsolescence. Thus, Aman derided the lack of regulations, which were not enough to curb the illicit trade, allowing for each actor along the value chain to make profits. This shows that there was something beyond laws that made such exchanges not quite appropriate.

The man's association of recyclers with Shaheed also emphasised the overall negative nature of these transactions. Recyclers, as everyone knew and a wide variety of people related to used or scrap electronics confirmed, did not do any recycling work but sold the collected materials back into the informal markets. This was a widely shared fact although as far as I knew Shaheed never bought directly from recyclers. Instead, he would buy from other scrap dealers, or the open market, waste that, in fact, may have already been returning from the recyclers.

The Malik scrap value chain brings into view how, once electronics are discarded, each round of sorting, breaking, and accumulating adds value in search of a buyer. The drivers of this market exchange are the "marginal gains" (Guyer 2004) to be made when material crosses a threshold adding up the numbers and aggregating volumes. The price becomes the cipher for the material and economic relationships rooted in the caste-based business of the Maliks. However, *maal* is not uniformly sold as scrap, but larger margins can be made when scrap is recovered in various contiguous and opposing value scales. The "kinetic counting" and "marginal gains" of the Malik value chain of e-waste presents a radically different way from how reports and policy makers calculate volumes of e-waste in the world.

Counting e-waste

The origin of the e-waste from a policy perspective started with the first reports of environmental advocacy in the early 2000s and coincided with significant growth in electronics consumption and the concomitant growth of e-waste. This was explained away with rapid obsolescence rates built into products led to the discard of electronics at accelerated rates (Grossman 2007; Gabrys 2011). Accelerating rates of obsolescence keep value constant in the information technology industry just like sell by dates in the food industry (Giles 2014). The question, rather than economies of scarcity, is how to produce more and destroy more (Bataille 1991). The logic of planned obsolescence built into design as well as expanding consumer markets across the world including India underlies the calculation of the volumes of e-waste in the world.

The development of the e-waste market in India was initially pushed by the influx of e-waste from abroad as the Toxics Links first report emphasises. "In a single month, there is a reported case of import of 30 metric tonnes (MT) of e-waste at Ahmedabad port in India" (Toxics Link 2003, 4). While the report focused on the growth in the influx of imports, it also highlighted that there was a significant secondary market in old computers as far back as 1989—models of Pentium 486s and older. However, it could be safely assumed that that these old technologies will be "soon to be added to the waste stream as upgradation beyond a point becomes uneconomical and incompatible with software in demand" (Toxics Link 2003, 4). Thus there is early evidence of an awareness of secondary use and second hand markets, despite Lepawsky's (2018) claim to the contrary. However, the Toxics Link report did not find it important to dwell on the workings of second-hand electronics. The lack of interest can perhaps be explained by the words of Satkar, the founder of Sahih Kaam: "Forget repair, repair will happen anyway," for what matters for the environment is figuring out "what happens to computers that become scrap." However, second hand markets and repair are crucial from the perspective of counting e-waste.

How the category of working order electronics impacted the e-waste market can be surmised from the Toxics Link report:

> [I]n case of trade in e-waste, there was an astonishing increase in the supply of material prior to sufficient demand for it. This sudden supply was stimulated by huge influxes of imported computers and 'home scrap' from Indian households and public and private sectors. The secondary market of electronic goods was capable of handling computer waste generated from households and public and private sectors. However, it was not well equipped to find markets for the imported waste. This inability of the secondary market to absorb computer waste created a space for scrap dealers (Toxics Link 2003).

Thus, the report indicates that the scrap market originated in the flooding of the market with used electronics that could not be absorbed in the second-hand electronics market. There was some demand during India's IT boom for refurbished electronics, but not enough in comparison of the sheer bulk of imported goods.

On the topic of circuits of reuse and repair, Corwin (2018b) argues that nothing in fact becomes waste in the e-waste sector in Delhi, but rather continues to be reused in the second-hand and repair economy. Corwin bases her argument on research done with repair shops in Nehru Place, Asia's largest second-hand electronics and repair market. She found that electronics always fetch a higher price when sold for reuse and repair than when sold for scrap (Corwin 2018b). Yet, such a formulation does not explain how things end up as scrap. For repair and reuse are one, albeit an

important one, of the logics of sales in second-hand electronics. The second-hand market extends the life of electronic discards before, after several rounds of reuse, the obsolescence that is designed into electronics eventually sets in. These categories are complicated by further segmentation between *challu* and *iscrap*. *Challu* items are those that are sold for reuse and repair and scrap is when there is no demand as *challu*. On the couple of occasions that I went to Nehru Place to follow up on Corwin's points and learn about the repair and secondary use economy, what I found was that the items that do not sell anymore for reuse will make their way into recycling circuits. Nehru place has ten *kabade ka dukaan* manned by Maliks from the same caste as the ones I encountered in Kabadabad. However, much of what remains after repair are worthless plastic sheets of laptop screens, that is called *kuda-kacchra,* the nominal value of waste that cannot be revalued any further.

In contrast to the calculative logics in the scrap trade and secondary use, "The Global E-waste Monitor" (Baldé et al. 2017; V. Forti et al. 2020) provides a different calculative logic in how it calculates the official data on volumes of e-waste across the world. The monitor bases its calculations on the total amount of electronics sold in the world compared to the official rates of planned obsolescence. The result of 44.7 million tonnes of e-waste generated in 2017 is then compared to the data available about the quantities that have been documented to have been collected in formal recycling channels. These calculations become the basis of pronouncements, such as that eighty percent of the world's e-waste is dumped or recycled in the informal sector. This calculative logic also underlies the E-waste Rules of 2016 and the targets calculated as EPR compliance in India. Yet, evidence about the multiple ways in which used electronics add up, aggregated, and their lives are extended in secondary markets, indicates that official obsolescence rates are inappropriate to be taken as the basis of statistics and the law (more on this in chapter 5).

Rather, what we see here, are different spheres of circulation based on the specific ways in which materials are recovered for their use value. However, this may not mean, as Corwin argues, that "e-waste in India [is] operating primarily within economies of reuse and repair" (Corwin 2018b). Rather, reading Corwin's research alongside my ethnographic data about the Malik value chain shows that there are complex scales of valuation, beyond commodities and value, which are at play in various electronics markets.

The story does not end at "the market model of price formation" (Luetchford and Orlando 2019). The above quote thus provides an interesting take on the genesis of not only the scrap market, but also e-waste itself. The way material is handled in the secondary reuse market and the scrap market complicates the widespread assumption on which EPR and the e-waste Rules are based. In the

policy makers' perspective, the main differentiation is between electronics in use and post-consumption discards; yet, as the above considerations demonstrate, e-waste is patterned by complex value scales effected by materiality.

E-waste's materiality and the potential for revaluation

Interval scales of challu, *scrap, and* kacchra

At each transaction a load is assembled and separated, CPUs are sorted from CD-ROMs, keyboards from CRT monitors, laptops are collected, batteries are removed, to achieve critical bulk in each category. As long as items work, they are sold as they are, which is often indexed as "it sells [*bik jaata hai*]," or with the more specific "it goes with the working order items [*challu mein jaata hai*]." Currently, as Mohsin told me, computers up to Pentium 4, introduced in 2000, continue to be sold for reuse, though Pentium 4 laptops do not sell anymore but are scrapped. This means that the computer mainframes produced in the past twenty years have not entered the scrap circuits yet. In the meantime, the guidelines published by the Central Pollution Control Board (CPCB) calculate that the average life of computer mainframes would be ten years. Thus, according to the CPCB's calculations, Pentium 4 computers should have been scrapped long ago.

Worse still, when computers break down, their parts can still be sold for *challu*: the hard drive is sold one way, while the SMPS (Switched Mode Power Supply), CD-ROMs, mother boards are each sold separately. When any of these break down, they are sold for scrap. Even when sold for scraps, parts of mother boards and CD-ROMs, the result of further disassembly: motors, transistors, ICs, can still be sold for *challu*. The rest are sold for scrap, but "what no one wants anymore, that's waste [*jo kisi ko nahin chahiye, wah hai kacchra*]."

Such deliberations highlight that the complexity of the scales of measurement determine the way electronics break down, break apart, are accrued in homogenous material fractions, and are revalued in various circuits. For an understanding of multiple scales of value, Guyer's deliberations on "marginal gains" provides a useful starting point (Guyer 2004). In spaces where the economy is not entirely determined by the values imposed by the state, such as in monetary exchange in Atlantic Africa or the e-waste markets in peri-urban Delhi, the assumption of continuous scales of measurement breaks down. Instead, as Guyer argues, nominal, ordinal, interval, and ratio scales produce disjointed and non-continuous value scales, across which practitioners need to find "hooks" to help conversion across spheres. Scrap, *challu*, *kacchra* indicate tropic points that help *kabadiwallas* navigate the equivalences and commensurations that the e-waste market produces. In addition, quantity can also become a scale of value as seen from how aggregation becomes another

way to earn marginal gains in the Malik value chain. Such judgements of worth are the way in which people make sense of the world (Fourcade 2016).

Aman, who implied that Shaheed was making "illicit" profits on e-waste, was a Hindu man in the gaming console business. He came to the warehouse from time to time to buy keyboards for refurbishment. While we waited for Shaheed, as he went to pray in the mosque, Aman explained that he was on the lookout for branded keyboards, mainly TVS. While chatting to me, he instructed his *auto* driver[10] to bring over different keyboards, accepting some, rejecting others. When pressed on the topic of how he decides, he showed me:

> See, these buttons go in and then they come out again, but these they go in but they don't come out. Buying such a keyboard would mean having to spend too much time on repair, so I don't take them. From these, I could only fix 8-10 a day. From those with working keys, where perhaps only 4-5 keys have to be replaced, I could restore 45-50 pieces a day.

He also said that, depending on the model, he could make a profit of 80–150 rupees per keyboard. There was one more catch: he needed the knowledge of which keyboards could be made USB compatible through an adapter, as PCs nowadays were not equipped with the old *golwala* PS/2 ports. According to other scrap dealers, keyboards with the *golwala* connection port go for scrap because of the limited connectivity of PS/2 ports phased out around 2000. The man, through a little extra effort and knowledge, could earn higher margins by buying up keyboards destined for scrap and fixing them up with a USB transformer.

To understand better how scales of valuation patterned the material processes of obsolescence and the breakdown of materials, I offer another example about a tropic point, or "hook" for linkages between the disjointed value scales of *challu* and scrap markets. The humble CD-ROM player that my friends Shaheed and Samir dealt in provides a good case study. They stacked a category of CD-ROM players called SATA stacked neatly by the wall to the right of the crammed, dark workshop's entrance, instead of throwing them on the ground to be broken. For lack of other options, I found out from Wikipedia that SATA is a type of data transfer technology that was introduced in 2000 when the older type of connection PATA was phased out. Therefore, only SATA CD-ROM players could be fitted in computers produced after 2000. This technological development also meant more cost-effective production, since it is less material-intensive, which,

[10] *Auto(riksha)* is a three-wheeler vehicle with the mechanics of a scooter, fitted with wide comfortable passenger seats for three at the back. The *auto* is the motorised version of a *riksha* and is used as a vehicle for hire to cover short to medium distances within the city. Aman was clearly in a regular and closer employment relationship with his driver, judging by the way in which the latter performed other services, such as assistance in selecting keyboards.

however, promises less material recovery for Shaheed. For this reason, these later models may fetch a higher price individuated as *challu* items when sold by the piece. At the same time, it would also be less economical to break SATA than the older pieces with more non-ferrous metal content. Bought at scrap prices, if someone would find use for these, they could have crossed back from scrap into second-hand circulation, just like keyboards sampled by the man who accused Shaheed of making illicit gains. Yet, eventually, with transition to cloud storage and the phasing out of CD-ROM players altogether, SATA are also getting hopelessly obsolete and will eventually need to be taken apart.

In a similar way, SATA indicates an interval scale to indicate further segmentation beyond *challu* and scrap, for SATA may be bought and sold in the scrap circuit but has the potential to cross back into the *challu*. At the same time, SATA eventually being phased out of reuse is also threatening to assume negative value, because as scrap it is worth much less for its high plastic and steel to non-ferrous metals ratio. I understand such potentials for revaluing in different spheres to be driven by "interval scales of quality," which are nuancing an analysis of the nominal scales of waste and value. Such nuanced qualitative scales operate a well-defined and refined price scale, which have come about not so much by market regulation but through the practice of dismantling, and calculations that are inherent in such material transformations.

One way in which producer brands prevent discarded electronics from continuing to being revalued in spheres of *challu* circulation is through destruction. Often, working order hard drives, laptops, and flat screens are destroyed by drilling holes into them, making it impossible to reuse. In reality, however, even such items may find a way back to reuse and repair. A laptop, for example, whose screen has been drilled through, may still be sold for parts. On a visit to Nehru Place, a repair hub going by the epithet Asia's largest electronics market, Vishalji, a repair shop owner demonstrated. this issue. While chatting about computers and parts, the hands of the middle-aged repairman did not remain idle. To underline his pride in the trade, he took in hand a used laptop cover, "cannibalised" of all parts, except for the plastic of the case and the screen. Vishalji had bought the laptop from Sony with a hole drilled through the screen. The hinges would be sold for 500 rupees to a customer whose own laptop had a broken hinge. To sell the plastic case with a hole for 1500, he patched it up with a handheld solder, while explaining that a new one costs 7000 rupees. Out of the one or two sheets that make up the screen, the thicker ones were to be sold for scrap, the thinnest one was not recyclable and would go to the rubbish, a small pile in cardboard box that only fills up once in a week. To drive home the lesson of this demonstration, he gifted me with a *kahavat*, a saying from Haryana, *Haathi ek lakh ka, mara hua sava lakh ka* [an elephant of 1 lakh rupees is worth 1.25 lakh when dead]."

The saying sums up astutely that it is worth more to sell broken electronics for part, than for scrap, confirming Corwin's (2018b) findings. However, this was also true of the scrap trade, where money accrued at every step of the exchange chain. The examples also show that the particular interval scales of *challu* and scrap are animated by the particular, uneven ways, in which electronics decay and fail, produce a heterogenous time to be bridged by skilled repairmen and scrap dealers. But skill/knowledge is only part of the story. To reap such gains, laptops and computers are much more amenable to ways of making profit, as they do not decay as fast as flesh and can be stored over long periods of time. Yet, the crux of the trade in *challu* is that a large volume of items needs to be stored over a long period of time, waiting for revaluation. Vishalji claimed that the laptops, visible in the shop being filed carefully on steel shelves, were only one percent of all the laptops he had in his off-site warehouse. This is how he could maintain a business that was based on the claim printed on his business card that he could source parts for any laptop.

Thus, because of the heterogenous make-up of e-waste, in which both high and low value materials are irreparably caught up and entangled, their separation produces fractions of varying worth. The unevenness of the labour evens out the material gains from this industry. Yet, besides the demonstration of "marginal gains," the way in which these complex value scales play into each other demonstrates that e-waste is not cheap, let alone free, but is a high value material. At the same time, e-waste dealers were often responding to local fluctuations and local timescapes of markets. Thus, these examples also show how the price of e-waste, although global metal prices also must be factored in, are also inflected by nominal and interval scales of value based on design and the patterns of material breakdown.

Materiality

In the process of breakdown and revaluation, the diverse material flows of e-waste cross many thresholds, social, material, geographic and legal—mediated by materiality—aiding the *kabadiwallas* to earn marginal gains.

The materiality of e-waste provides the frame for such exchanges, but also becomes the object of it. Since electronics in use has a dispersed materiality across households, offices, industrial units across the country, it first requires the labour of aggregation. Yet, as Sahih Kaam employees explained, they did not find it economically viable to organise individual household collections. Thus, to move e-waste out of the households required a re-education of the consumer to recognise e-waste as waste and not hold onto it. Furthermore, the trouble was that consumers recognised that e-waste might hold value and expected a payment for it, which made individual collections even less cost-effective. The Maliks, on the other hand, operated an efficient logistics network that

were present "in the last mile" and linked up to central markets to produce mass waste. When small traders work through their *maal* and break their items, the resulting fractions are sold off to traders, the exchanges are calculated to finance the logistics network much more effectively than Sahih Kaam, or any other actor in the e-waste ecosystem could. At the same time, mass e-waste then had to be separated according to the kind of devices to be sold off to specialist small traders. (While Maliks operate the e-waste trade, there's no clear sense or awareness of specific communities picking up plastic, *loha* [steel] or PCBs.) While plastic and *loha* was picked up by specialised local dealers, PCBs and optical drives were picked up by traders from further out toward the periphery of Delhi, such as Loni and Mandoli, or even Muradabad. These were the areas where *batti*s or non-licenced small-scale smelters were located. In this way, the Malik value chain produced mass waste according to very different logics than it would be done in the Global North where, once e-waste is aggregated, it is fed into reverse logistics factories with integrated disassembly lines, where the hybrid materials are shredded together and then separated by machines.

Consider this through Shaheed's case. Shaheed and his brother Samir sold keyboards and dismantled CD-ROM players. Shaheed did daily rounds to the *khatta*, the open space of the open market to sample the wares of *pheri-phere walla*s. When he collected a cycle *riksha* full of CD-ROM players by picking through several trucks full of wares, he plied the *riksha* home, threw the sacks on the ground and left again. Sometimes he was called to buy a few stacks from other shops of fellow Maliks who did not trade in CD-ROM players. The steady flow of CD-ROM players in the office was dependent on the careful gathering that he did by hearing of smaller loads from here and there, which other sellers would not have known what to do with. He talked of a friend he had, who brought *maal* from elsewhere in the country, but to buy from that person he would have needed much bigger liquid capital to pay for the whole truckload.

Once Shaheed dumped the sacks on the floor, the process of sorting and separation would start. Different qualities of CD-ROM players were handled differently. He would pile those intended for breaking in the small area in the middle of the floor that was clear of already separated material in different forms, bagged in sacks or amassed in undulating waves of material that climbed up by the wall towards the ceiling. Shaheed's disabled brother Samir meanwhile squatted in the midst of it all, breaking 500 CD-ROMs a day into their four fractions: steel, plastic, optical drive, printed circuit boards. A particular kind of CD-ROM players have several types of small motor that he would occasionally pick from PCBs. Through the sale of separate fractions to the downstream buyers of steel, plastic and PCB-*wallas*, Shaheed and his brother made a few rupees on each CD-ROM which they bought for variable prices between 25–55 rupees a piece depending on the type.

The resulting plastics fraction from CD-ROMs is high quality, sells for 40 rupees a kilo, and is then again sorted by the plastics buyer according to colour and quality, to be sold again for a slightly higher price. The steel sells for 25 rupees, motors and lenses are sold for 60 rupees per kilo and sent for copper recovery—so Samir explained to me. For the purpose of breaking, the older the CD-ROMs are, the better it is, since they contain more raw material. Samir refers to this category as *bada* PCB *wallah* [the ones with large PCBs]" that which have printed circuit boards heavily embossed in gold. But these also come at a higher cost anticipating the higher rate at which its PCB will sell, between 300-500 rupees a kilo. Occasionally, Shaheed or Samir would draw my attention to a particularly heavy piece. Having it broken, they would hold up a board larger than their hands, all sparkling with gold.

The calculative logic of planned obsolescence and technological development does not just produce e-waste, but determines the pattern of electronics breakdown. The distinct patterns of breakdown result in complex and intricately related circuits of exchange operating between diverse value scales. Technological development, changes in models, technological sophistication, durability, materials used, design solutions, warranty policies, all lay the ground for the distinct ways in which materials might move across these value scales. The effect of these distinctions does not come to an end after electronic items are discarded, but technological differentiation as a particular form of materiality continues to pattern the market in used electronics as well as scrap. The Toxics Links report highlights one of the ways in which items become obsolete, as differentiated from continuing to operate in the second-hand circuits, but there is more to the story.

Potential for negative value

In this sense, I find it useful to think of e-waste through the "social life of things" and "regimes of value"," where objects come in and out of commodity status depending on the social worlds of which they are part (Appadurai 1986; Kopytoff 1986). I also find the commodity and gift dichotomy inadequate to think through for a number of reasons. One is that the categories of commodity and gift in Delhi's e-waste market must be completed by the third value form waste. Even further, as Alexander and Sanchez (2018) show, waste and value are nominal scales of form but it is also important to recognise the state of indeterminacy that lies between the two. Indeterminacy recognises that the sorting that produces the value judgements of value and waste also produce materials that are non-categorisable. It is just the matter of someone else coming along with a different perspective to pronounce value on them. For example, in the Malik warehouses young sons before coming of age earn pocket money from picking up materials such

as small rounds of the silicon that makes keys on the keyboard spring back. This is *kacchra* that no one wants which, once the teenage son picks it up, is shown as a material that still carries potential for revaluation, even if the warehouse owner did not find it economical to do so. Another reason why "the social life of things" appears inadequate to describe e-waste's revaluation is rooted in the imperative of mass waste, requiring infrastructures on an almost industrial scale. Rather, the kind of attention suggested by "the economies of recycling" framework inspires my thinking, where material breakdown produces multiple economic, social, and material value scales (Alexander and Reno 2012; Crang et al. 2012). These studies point towards the necessity to look at the materiality of waste and take it as a departure for examining the exchanges that carry the potential for revaluation.

By e-waste's materiality I mean the material features of discarded electronics, which are determined by their pre-consumption design but exert their effects in unexpected, unintended ways when electronic items enter into circuits of reuse, repair and scrap. For this, I take inspiration from Gabrys's natural history method which, "allows for an inquiry into electronics that does not focus on either technological progression or great inventors but, rather, considers the ways in which electronic technologies fail and decay" (Gabrys 2011, 6). I link this to Venkatesan's definition of materiality meaning the "state or quality of being material," a focus on which "means being attentive to the ways in which the state of being material is achieved or caused" (Venkatesan 2014, 72). When it comes to e-waste, the state of being material is determined by pre-consumption design and material composition, which were once aimed at making digital life possible. However, after discard, it patterns revaluation. Venkatesan responds to Ingold's angry tirade against the concept of materiality and attempt to excise it from anthropological vocabulary for obscuring the way in which materials, such as stone, wood, and water, have an agency on their revaluation as objects of art or of use. For Ingold, the concept of material properties ought to suffice in describing a world in which

> [t]hings are alive and active not because they are possessed of spirit – whether in or of matter – but because the substances which they compromise continue to be swept up in the circulations of the surrounding media that alternately portend their dissolution or – characteristically with animate beings – assure their regeneration (Ingold 2007, 12).

Venkatesan (2014) interprets Ingold's polemics to be about whether material properties and "the state or quality of being material" are imposed from the outside by human will, or are emergent from the property of objects. Laying aside the details and stakes of the debate, what concerns me here is thinking of the imposition of human will on materials and materials' emergent qualities.

While I find Venkatesan's insistence on the concept of materiality useful, given that e-waste's materiality cannot be divorced from human design, I also find evocative Ingold's characterisation of things swept up in the circulation and flux of materials in surrounding media. E-waste's natural history is similar to what Harvey writes about the materiality of concrete: "these configurations are simultaneously internal (to the emerging material structure) and external (configured in terms of the very human intervention in the processes of composition and decomposition)" (2019, 157).

In the effort to construct a natural history of electronics, Gabrys details how the use of microchips became so widespread. In the 1970s, the time of great technological development, Intel consciously pursued an economy of abundance, keeping the price of microchips below production costs. Moore predicted in 1965 that the number of transistors per silicon chips would double every 18–24 months, which produced a technological "invention" of speed for the growth in transistors led to faster and more efficient electronics (Gabrys 2011). This, compounded with Intel's policy to keep the price of microchips below what it cost to produce them, led to the widening use of microchips, leading to "a positive feedback loop where electronics contributed to their own proliferation" (Gabrys 2011, 31). Moore's Law drove the rate of designed obsolescence leading to accelerating growth in volumes of e-waste. In addition to Moore's Law, other technological improvements, such as the evolution of screens, modes of connection, printing, etc. all contributed to pushing a large amount of electronics off the shelves, out of offices and homes, into circuits that at the time led from Silicon Valley and the Global North to recycling villages and second-hand markets in China and India. Despite evidence that the EU made efforts to keep up with waste management, economic expediency in both US and EU often made it more feasible to export post-consumer electronics, often even at the cost of violating the Basel Convention, the international treaty that regulates the export of hazardous wastes. Thus, the natural history of electronics led to a surge in available materials in second-hand markets in Delhi.

Since different parts of electronics fail at different intervals, the logic of reuse initiates the force of attrition. As items are cannibalised for their still useful components, shells and broken parts are broken down further to be unmade into materials that can be fed back again into production. The process of attrition, propelled by a vibrant market in used and scrap electronics, reveals again the material composition of items, cathodes, steel, plastic, optical drive, different motors, that make up electronics. A process of unmaking goes against the logic of fetishization of the effects of electronics production, which obscure for users and consumers the material affordances of electronics (Gabrys 2011). Moreover, the mode of unmaking can release toxic substances, a particular form of indeterminacy. At the same time, the legal obligation of electronics producers to spread awareness about the toxicity of e-waste is a way in which toxic effluents uncategorisable

within nominal scales of value and waste gain meaning. In particular, the goal is to make users of electronics aware of all the modes in which value is created from the particular "ways in which technologies fail and decay" (Gabrys 2011, 6).

Building on this, I argue that thinking through Gabrys's natural history of electronics helps us see beyond the threshold of waste and value and animates the nominal scales of *challu* and scrap. This way we can begin to understand the messy paths of revaluation that e-waste goes through after it has entered circuits of scrap. Beyond the threshold of waste and value, various kinds of material transformations, conversion from piece rates to measures by weight, exchanges between the formal and the informal sector, provide additional thresholds for margins to be made. The materiality of waste plays a determining role in the dynamics of the market and, in turn, e-waste is materially affected by the transactions it passes through. These include the potential for material to turn into negative value.

Sahih Kaam prices and formal and informal sector value scales

It is in this scene that the new forces of formalisation enter, set in motion by the hard labour and collaboration of civil society, international development organisations, and government officials. In preparation for the introduction of the EPR law, large electronics producer companies encouraged the founder of Sahih Kaam to set up a company which would manage the fulfilment of producer's responsibility, a Producers' Responsibility Organisation. As a newcomer to the e-waste ecosystem, the PRO's job was not easy, particularly that it was trying to set up a different model from other PROs which were often established by recyclers already in the business of acquiring e-waste. What they found were non-monetary boundaries to entry, despite their ready availability of capital. The difficulty arose from the incompatibility of the spheres of exchange as well as the different calculative logics with which *kabadiwallas* operate. However, the bridging of the informal and formal value scales also provided the potential for profits. According to Guyer, "When one scale is not exactly reducible to the terms of another, a margin for gain lies in the negotiation of situational matching" (2004, 51).

According to those who took part in setting up the company, it took a long time and a great amount of work to make the first purchase in the informal market. Satishji, the field executive of Sahih Kaam, spent six months roaming the streets, wearing clothes "like they do," he emphasised. Satishji and the others involved in the operations cited the lack of contacts and trust as significant reasons why the locals did not want to sell. However, the more significant reason came out when I started asking questions why the PRO did not go directly to the *khatta*, the open market of the

pheri-phere Maliks, since they could buy for a few rupees less by cutting out the middlemen. It turned out that the additional barrier was that the PRO wanted to buy with bank transfers, while the Maliks were used to trading in cash and on *udhaar*. Although udhaar means cash loans, in the practice of the e-waste trade it meant that the buyer could take the *maal* and return the money for the transaction once the buyer had found another buyer. In contrast, Sahih Kaam could only buy through bank transactions, because for the process of formalisation they needed proof of the transaction for the paper trail that made their e-waste formal and regularised. At the same time, the quantity and quality requirements for the fulfilment of targets was also a barrier to buying from the *khatta*, where *maal* would still be more piecemeal than if Sahih Kaam availed of the aggregative function of the scrap dealers.

The result, it seemed, was that prices for the market were one, and for Sahih Kaam another. The PRO interpreted the state of affairs in the sense that the scrap dealers were charging Sahih Kaam a higher price than the market price. In effect, however, keyboards, CPUs, laptops, mice, printers, and mobile phones were sold for only a few rupees profit, potentially about the price that they would have earned had they been dismantled. The benefit was that they saved the use of space and labour power. This made Sahih Kaam a desirable trading partner for the scrap dealers, especially in the initial months and year of operations, when payments came promptly a few days after delivery, as Shaheed ruefully recounted at a later date. However, for Sahih Kaam, it meant working with a price that was a composite of exchanges and labour (Guyer 2009) that led to the material—separated into IT categories and aggregated in quantities—recoverable from the market in the quantities that could count towards producer's targets determined by EPR.

In fact, as they had found out, e-waste was not the worthless material headed for the landfill that needed to be salvaged from the hands of desperate e-waste workers. They found a dynamic and organised trade with the particular gain structure as explained in the first part of this chapter. This structure meant that the quantities that were required for fulfilling the EPR targets set down in contracts with producers called for an intervention at the level of the aggregators, who had already produced mass waste. That meant also that bulk had already built into it the gains of each previous step of the way. In this context, Sahih Kaam needs to recruit a steady group of "aggregators," as they call them, to provide access to larger quantities in each waste category required to fulfil producer targets: tonnage of CPUs, printers, keyboards, laptops, mobile phones, etc. However, this means that the price of the individual items is already high, as the aggregation itself, through the marginal gains of each transaction, adds up and creates a composite price (Guyer 2009; Luetchford and Orlando 2019). At the same time, the mass waste produced in the Malik value chain was curated towards a different value scale from the one of EPR compliance.

Originally, when planning my fieldwork, I had planned to observe negotiations over price. However, when I arrived, there were no live negotiations to witness in the market. Prices had been agreed upon beforehand and Sahih Kaam now acquired different items at already set rates. At first, as Sahih Kaam was happy to make a deal at all, things went well for all concerned. In the beginning the producers who signed up for Sahih Kaam's services were also happy to accept the higher rates per kilo due to the company's reputation of doing good work by sourcing and rechannelling waste. This was seen as both the effect of the novelty of targets and fear of government crackdown on imports if the producers' EPR liabilities would not be fulfilled properly. Producers also signed up for Sahih Kaam's services to boost their marketing image as doing the right thing. However, after the first year of operations there was an expectation of reducing the price of services. Given the difficulty of negotiating other costs that made up the rates offered to producers such as logistics, warehousing costs, employee salaries, technological development costs, the price of e-waste set by the aggregators appeared to be the most appropriate point to effect a reduction.

This was compounded by the internal pressure to increase the profitability of the enterprise. Varun explained that in pursuit of a better price there was a drive to acquire e-waste from ever cheaper sources. Varun also explained Sahih Kaam's strategy of having established exchange relationships with *kabadiwallas* across the country. Keyboards, for example, were sold for less in South India, where regularised recycles were also more likely to take keyboards than in and around Delhi. This had meant that it did not make much economic sense of buying keyboards from Shaheed at higher prices anymore. Yet, he was a long-standing and trusted aggregator and that relationship had to be valued. At the same time, financial pressures also meant that despite the wide availability of materials in the market, Sahih Kaam might not find what it was looking for at the right prices. The company's willingness to pay higher prices changed only when, towards the end of the financial year, there were still targets unfilled.

Instead of the open haggling, thus, I found that Sahih Kaam's negotiation techniques relied on increasing their pool of potential aggregators and finding ways to acquire materials from other scrap dealers. One day, halfway into my year of fieldwork, I got a text message from Amit, a logistics expert in the operations team, who had become a friend in the office: "Can you come in tomorrow? There is a new guy in office, and he wants to meet you about the market. He has good knowledge of the components inside computers, you should meet him." When I made it to office, I was invited for a chat with Mr Kakkar, a new employee in mid-management who was brought in to streamline the operations team. This was the arm of Sahih Kaam that dealt with acquisitions, logistics and the disposal of e-waste with regularised recyclers.

Mr Kakkar had heard about me and my work which involved spending much time in the e-waste market in Kabadabad. He thought that I would be able to tell him if Sahih Kaam was paying the right price for the e-waste it was purchasing from aggregators. I was only one of his hopes for gaining such knowledge of prices, as parallelly he sent out other, recently joined employees to make enquiries. With Mr Kakkar's presence in the company, there was a remarkable shift in the attitude towards aggregators. The early gratefulness for enabling targets to be fulfilled on time had turned to one of "we know we are being cheated" within a year or so of having started collections. After my meeting with Mr Kakkar, I also encountered the founder, Satkar, who also emphasised the potential duplicity of my new friends in the informal market. But his concern was more with whether Sahih Kaam was reaching "the right players? The biggest players?" The other concern of Satkar and Mr Kakkar was that Sahih Kaam was paying a high price for low-quality waste. This was something that could be explained by the nominal and interval scales of value that drove market exchange in Kabadabad and the calculative logics of EPR.

I was reluctant to comply with the request, once I realised that I would be complicit in undercutting the prices of *kabadiwallas* who had become my friends in Kabadabad. Yet, in exchange for the half-extracted promise of helping them find out better market prices, Mr Kakkar shared his knowledge of materials with me. He gave me the example of SMPSs (Switched Mode Power Supply), the power supply of mainframe computers and servers:

> "There are different qualities of SMPS on the market and depending on quality the metal in transformers will vary, it can be either copper or aluminium. The capacitors on the PCB will be higher quality, as will the metal casing. When buying 40-rupee stuff, they will be selling the 40-rupee stuff for others, while they'll be giving us the 20-rupee stuff for 50."

The accusation of cheating indicated that the aggregators found a way to convert low-quality SMPS in the Malik value chain into a higher priced commodity in formal channels.

Mr Kakkar's other example was keyboards, an item I was more familiar with because of the time I had spent in Shaheed's warehouse. "There are three types of keyboards; one, when you press it, it does *tak tak*," he indicated the loud sounds made by pressing each key. "One of these keyboards weighs about 900–1000 grams, and has a big PCB, the second category are the branded ones of HP and Dell, they weigh about 700 grams, and then the *local* stuff which weighs about 500 grams." The heaviest keyboards were the oldest ones, their plastic also sold for higher prices, and they were worth more in terms of weight because each included a big, shiny gold embossed printed circuit board. The value in the second category consisted of the plastic sheet printed with silver, while the final, *local* category was just made plastic and a bit of copper wire, and nothing else. *Local* was a

temporal clot on the interval value scale widely used in the Kabadabad market. The reference to local things as low quality is also widespread in all markets of consumer goods in India, including clothes, and is used to mean the opposite of a branded item. Such tropic points help calculations and determine exchange as a qualitative mode of valuation similar to judgements about originals and fakes in Guyer (2004).

Still, Mr Kakkar and Satkar were not going to give up, so they set about to bargain down the prices. In principle, Sahih Kaam should not have distinguished between higher quality and lower quality items, since their purpose was to clean up the market. However, when selling the waste on to the formal sector, recyclers would complain if they would receive low quality material as the value of materials recovered did not much exceed the cost of recovery or could even turn into negative value. Selling the cannibalised items would be deemed *kacchra*, indicating the nominal scale of low resale value. In the case of SMPS, for example, if the wire coil in transformers were made of aluminium rather than copper, that reduced the value of materials significantly. Mr Kakkar reasoned that while aggregators might think it more profitable to sell the lower quality at a higher rate by the kilo to Sahih Kaam, they could perhaps be persuaded to sell higher quality ones by making them see how they can also profit from such transactions. That is, Mr Kakkar, upon joining Sahih Kaam, promised to get to the end of reducing the acquisition price of e-waste, in the interest of reducing the cost of operations. A move which was predicted already by Varun towards the end of the previous financial year.

Mr Kakkar reasoned that while aggregators might think it more profitable to sell the lower quality at a higher rate by the kilo to Sahih Kaam, they could perhaps be persuaded to sell higher quality ones by making them see how they can also profit from such transactions. However, reducing the rates at which Sahih Kaam purchased e-waste, could alienate the dealers, a development that could jeopardise the fulfilment of targets, a necessary activity if they wanted to keep producer clients. Sahih Kaam thus began to demand *maal* at a price one or two rupees less per kilo, refusing to pay what they had been paying before. This elicited rueful complaints from Shaheed and other interlocutors in the market, that prices are lower, and payments take a long time. Shaheed first refused to lower his rates, but then eventually gave in. On one occasion Mahmood pointed the question to Manish, the person who worked closely with them on an everyday basis sourcing material: "What happened to that promise that you made when you first came to the market that you'll pay a higher price, only we should stop breaking e-waste?"

Thus failure and decay of electronics does not convert to value or the lack of it in any straightforward way, but requires "the immaterial labour" of commensuration between different

value scales (Kockelman 2016). Formalisation can then be seen as an attempt to effect conversions between the disparate value scales. Guyer understands formalisation as the "the modern state's counterpart to conversion … Legal texts and conventional quantitative measures bring different value scales and different modes of measurement into relationship with each other" (2004, 155). However, the E-waste Rules of 2016 did not introduce state oversight into commensuration, but rather formalisation initiated the experimentation to find tropic points and hooks for effecting conversions between value scales. The formal sector become another value scale to navigate and, as this chapter demonstrates, price is an effective optic which brings these navigations into view.

Despite, or because of, formalisation, the informal market remains an open economy and does not result in an enclosure (Kockelman 2016). "In modern bureaucratized economies, nominal and ordinal scales are generally accepted as being established outside the price-setting of the market" (Guyer 2004, 83). However, in the e-waste economy in India, "standards, measures, and their reductive commensuration with one another have not been institutionally enforced or culturally validated … the means of bridging the ordinal with the ratio scale, through intervals remains open" (Guyer 2004, 84). The problem as well as the opportunity stems from the fact that standards of quality for commodities are not determined by state mechanism but arise from e-waste's materiality and thus become the subject of market mechanism. This is what PRO employees mean when they complain that the government does not provide any clear industry benchmarks or standards of mass balance recovery in the e-waste trade. Such benchmarks would fix the amounts that recycling plants must show to have recovered per load of items.

Conclusion

This chapter detailed the value transformations that come into view when examining the particular materiality of e-waste and the value scales that come into being through electronic breakdown. I started from the Kashmiri scrap shop at the extremity of the Indian waste management system to trace the origin of e-waste and the logistics network that bring mass waste into being. The Malik value chain operates the most effective e-waste collection network, but its calculative logics are driven by the materiality of e-waste. Gabry's natural history of electronics provided a good understanding of e-waste's materiality: that is an attention to how production design and pre-discard use patterns the secondary resale, aggregation, and attrition of e-waste as they become commodities in Delhi's extensive working order electronics and scrap markets.

Sahih Kaam employees often complained that there were different prices for the formal and the informal sector. The price was set according to the logics of the informal market and, in effect,

the company was just another buyer in the open market. At the same time, they also struggled with the high cost of establishing collection systems alternative to the Malik value chain. The real difference was that there were more than one calculative logics at play in organising the material of e-waste. While informal sector exchanges fetched high prices for material ordered and separated in the Malik value chain, Sahih Kaam's requirement to fulfil targets of legally defined categories in bulk required another logic. The exchange could take place by finding common ground or a hook between different value scales at one step of the informal e-waste value chain. However, that meant that, rather than criminalising the informal sector, as early commentators had feared (Gidwani and Corwin 2017), the Maliks became an important player in Sahih Kaam's path to creating channels for responsible recycling.

Since there is no way to get around the Maliks' aggregating capacity, Sahih Kaam's business is based on the service provided by the Maliks' extensive logistics network. Thus, the informal price of e-waste was already part of the composite price which made up the rate at which e-waste disposal services were offered to electronics producers. Initially it served well for Sahih Kaam to accept the informal sector price and hold up its relationship to work together with "the informal sector" as they totalised their relationship with their downstream vendors. However, these arrangements became cumbersome and an obstacle to converting their business development efforts into a wider producer client base and, therefore, the company attempted to renegotiate the price. The way to go about this was to double down on the company's all-India collection channels parallel to the Maliks' own.

A close attention to patterns of market exchanges in the devalued informal sector illuminates the reason why, despite legislations, the informal but highly organised market in e-waste continues to undercut efforts to formalise e-waste recycling according to international standards. The ultimate threat of landfilling highly toxic but at the same time valuable materials also becomes the force that drives formalising efforts. The materiality of e-waste, once the material foundation for producing electronics, reappears as a threat to the material world in the process of attrition. Here it is not about Ingold's (2007) romantic process of the surfaces of stones and wood reasserting their material properties when exposed to the elements. The potential for recovering value from electronics is rooted in a materiality of human design. The mass waste produced by the Maliks is also the result of human manipulations, and yet, the release of chemotoxic substances escape human intentionality. As Harvey highlights, "the mutually constitutive relationship of human and other-than-human worlds is not under human control, even when human intention appears paramount" (Harvey 2019, 157). In Delhi's e-waste ecosystem materials and their materiality produce value scales that make calculation required for formalisation difficult.

Chapter 3 Bodily Knowledge of Toxic Flows and Toxic Places Elsewhere

In the middle of November 2019, the sky was milky white, and pollution wrapped objects in a dirty haze on the streets, softening their edges and leaving a sticky feeling on my fingertips. The air quality index across the city was reading well above 500 pm2.5, in some places even above 800.[11] I got out from the apartment building, where I was renting a small bedsit, to the unpaved road. From the open sewers on the two sides of the narrow road rose the acrid smell of sewage. I walked past a man building a flow-through out of bricks and concrete, where there has been only solid dirt road before. Another piecemeal solution to the constant state of infrastructural breakdown in the neighbourhood where drains had to be desilted regularly, for they got blocked by plastic waste.

On this particular day, Shaheed was out on the road supervising the loading of what turned out to be one of the last shipments of keyboards to Sahih Kaam that year, as the targets for the computer peripherals category were almost full. Given the worsening air conditions in the city, I started wearing a pollution mask in addition to my usual attire including the modestly wrapped *dupatta* covering my hair (thin shawl worn to cover the upper body by Hindu women and wrapped around the head by Muslim women). As Salman saw me in my protective gear, instead of his usual greeting he launched:

"*Hamara gaon mein* pollution *nahin hai* [There is no pollution in our village]!"

Only then did he continue with the usual pleasantries, "*Assalam aleikum*! Are you allright? Me too, thanks to your prayers!"

Over the year I had come to know Shaheed to be provocative with his jokes. His cry at the sight of my pollution mask was evidently said in jest, yet I mumbled, slightly thrown off course, that I was wearing the mask because of the worsening Delhi air. Although the air in the capital was not having good press around the time, my mask in Kabadabad was interpreted as a sign of decades of media coverage on the harms of e-waste recycling.

For the previous years, during every winter, Delhi had been topping pollution charts. The firecrackers of Diwali, the Hindu festival of light, announced the season of heavy breathing and respiratory ailments with a loud bang every year. The dirty white haze that blocked sunshine and

[11] In the last few years, New Delhi has gained notoriety as one of the world's most polluted city. Particularly in the winter months, beginning with the end of October, the city is enveloped in a toxic smog with severely reduced visibility and ability to breathe. In previous years, the pollution levels reached the value 999 PM2.5 (Spears, 2019) as compared to safe levels which are supposed to be around 50–60 PM2.5.

any glimpses of the sky, came on seasonally towards the end of October. Shaheed was not entirely unaware of the harms of city-wide air pollution, yet, in the context of that morning, it appeared to him as a matter of honour to defend Kabadabad. It was his implication of intimacy through the use of the word *gaon* (village) for Kabadabad, a heavily built-up neighbourhood, part of the dense urban sprawl of Delhi, that alerted me to having touched a soft spot. Although the capital had entered its season of toxic air, reaching the worst levels from late October, there could be no pollution in Kabadabad, for it was *home*.

Shaheed's response to the provocation of my pollution mask also echoes the wider attitude to the issue of pollution and toxicity of residents and workers in Kabarabad. Despite the extensive global documentation and reportage of the toxic effects of informal e-waste recycling (BAN 2002; Toxics Link 2003; 2014), workers on the ground often deny or understate the impact of their trade on their own bodies and environment. Workers in Kabadabad, in general, seem less keen on talking about health hazards involved in the work of e-waste processing, than in comparable accounts from, for example, Accra, Ghana (Little 2019). Similar difficulties were encountered by other researchers who had tried to document people's lived experiences in China's e-waste processing villages (Lora-Wainwright 2017). Yet, Lora-Wainwright found an acknowledgement of the toxicity of informal e-waste recycling in everyday practices, which showed a tacit understanding of harm. Elsewhere, inhabitants of a Serbian industrial town (Jovanović 2018) displayed positive emotions towards the toxic smoke that enveloped their city emanating from the local factory, for they took it as evidence of availability of work and continuing prosperity. In Kabadabad, I found no such affection toward pollution, nor any folk practices of taking precautions, but these stories complicate the usual association of toxicity with locally situated narratives of harm. At the same time, they alert to the different ethnographic methods through which toxicity is revealed, despite its imperceptibility.

It puzzled me that after I had attended Sahih Kaam's numerous awareness activities and public performances, where e-waste's toxicity was always in the focus, I found little evidence on the level of discourse in Kabadabad itself. This was all the more troubling since *kabadiwallas* engaged more intimately with the materiality of e-waste, which would have set them up to be able to bear witness to the negative effects of toxicity and environmental degradation (Davies 2019). The question thus became why people had no conception of how toxic substances affected their body. This lack of forthcoming discussion of the bodily effects of pollution might have given the impression that e-waste recyclers in Kabadabad were less conscious of the harms of their surroundings. Yet, I argue that it was precisely Shaheed's denial, which pointed towards the presence; toxicity was to be denied because of an all too acute awareness of the damning effects of such evidence. Thus, not

only atmospheric attunements (Shapiro 2015), and the registering of toxic substances on the senses, but also their absence is constitutive of emplacement (Fennell 2015). In terms of methodology, how can anthropologists find evidence in the face of disavowal, lack of testimonies, and the hard-to-perceive nature of toxicity?

Apart from the methodological question, this chapter explores how "embodied value" and the biocommensuration of different bodies become the basis of intervention (Ecks 2022). I ask what was at stake when the PRO was demonstrating e-waste's toxicity and the kabadiwallas were denying it? My attention follows Agard-Jones's exploration of "bodies in the system" (2013) to draw relations of power between stakes and bodily perception in the struggle over the definition of e-waste.

Unevenness of Toxic Relations

The lack of well-articulated experiences is even more surprising because there is ample scholarly evidence of e-waste's toxic potential. The Basel Action Network's report initially called attention to the "witches brew of chemicals" contained in e-waste, which are released through inappropriate handling, "open burning, acid baths and toxic dumping" (BAN 2002, 1). Scholarly articles at first cited the BAN evidence listing "the more than 1000 different substances, many of which are toxic, such as lead, mercury, arsenic, cadmium, selenium, hexavalent chromium, and flame retardants that create dioxins emissions when burned" (Widmer et al. 2005, 444). The vocabulary of the early reports defines up to this day the way in which the impact of e-waste is talked about. The employees of Sahih Kaam use the same expressions when delivering awareness workshops to school children and bulk consumers. As a result of the warnings, experiments involving sampling started to be carried out. The main contaminants identified were lead and other heavy metals, and the release of persistent organic pollutants (POPs) (Man, Naidu, and Wong 2013; Singh, Duan, and Tang 2020; S. G. Singh 2020; Caravanos et al. 2011). Both lead and POPs are associated with cognitive and developmental disorders in children, as well as chronic illnesses and higher morbidity. POPs are also a cause for concern, for they accumulate in bodies and the environment, and are hard to metabolise. Eventually, it was found that even recycling in formal, well-regulated units in countries such as Sweden caused elevated levels of lead and other harmful chemicals in the air (Julander et al. 2014).

Yet, what matters for toxicologists is the level of toxicants in relation to thresholds, which creates multiple problems. Different thresholds in different sites make comparison difficult, for heavy metals US standards are lower than acceptable levels according to Indian standards. These

discrepancies make it hard for those not well versed in standards to read the data. Toxics Link's (Toxics Link 2014) study of soil and water in Loni and Mandoli on sites where e-waste was processed in vats of acid and burned for recovery of metals, referenced Indian standards. Also, while it appears that most of the findings of Loni and Mandoli were within permissible range, their analysis still stated that soil and water in these e-waste processing areas had been significantly changed. A more recent study (Arya et al. 2021) conducted in the e-waste markets of north-eastern Delhi compared findings to WHO levels and found that heavy metals and the acidification were significantly higher than previous findings, including the Toxics Link study. Even more concerning is the fact that thresholds do not tell much about lived experience. To top it all, even locally situated individual bodies may be affected differently. Yaakov Garb, an STS-trained environmental scientist based in Tel Aviv University, has been collecting samples in a Palestinian electronic waste processing site. In two pilot studies carried out in the area, blood samples were collected to check lead and PCB (polychlorinated biphenyls, a kind of POP) levels, they found that children playing around the same site and local inhabitants and workers did not always show results consistent with the level of exposure.[12] Even when results are more conclusive, biochemical research raises more questions about what it means to live in toxic environments than provides answers.

As the industrial complex introduces new chemicals into the world at an unprecedented scale, scores of substances remain unexamined as to what their effects on life may be (Fortun 2012). Chemicals, toxicants, pollutants are now present in the air most of us breathe, and in the water most of us drink, a condition that binds humanity as much as it divides (Murphy 2006). Living and acting in a permanently polluted world holds a very particular kind of challenge for most of humanity in the twenty-first century (Liboiron et al. 2018; Nading 2020). In much of social science's interest in toxicity, the central point has been to prove that harm is not located in 'the wayward particle' but rather defined by the power structures that enable effluents: their uneven spread and effects (Liboiron, Tironi, and Calvillo 2018). Despite anthropology's methodological handicap in establishing the veracity of claims to the toxic nature of things and places, the ethnographic method has the promise of constituting a situated, long term, and experiential approach. Moreover, ethnography calls attention to toxic relations and relations of power that expose some to greater harm than others.

Many biochemical studies into toxicity have not been able to shed their social biases, a point often highlighted by STS scholars of toxicity. Scientific experiments carry value judgements, too,

[12] In written communication with Yaakov Garb, 2021, regarding variability in pilot studies on lead and organic contaminant uptake as a result of e-waste exposure.

influencing the premise of establishing toxic relations. Particularly relevant is Murphy's argument that, due to the manner in which chemical exposures are materialised in experiments, they produce "regimes of perceptibility" (2006). As many toxic substances are imperceptible, often making it hard to establish direct causal relations, companies, and governments in power employ science to negate citizen's claims to compensation and to an improvement of conditions. Thus, establishing chemical relations becomes the task of citizens, scientists, activists and environmentalists in the face of the industry's denial (Romero et al. 2017; Harvey 2020). To challenge such uncertainties and trace power relations that lead to exposure requires transnational cooperation of loosely or better organised enunciating communities (Fortun 2001). Both advocacy and activist scholarship centre the human experience for its capacity to make sense of a toxic environment (Shapiro 2015). Local knowledges from affected sites often become central to international campaigns as, arguably, the "slow violence" of pollution will not remain out of sight for those who live with it (Davies 2019). The emphasis on bodies and local knowledges is also an important improvement on the assumption that poor people are unsuspecting, ignorant victims of the imperceptibility of "slow violence" (Nixon 2011). Yet, all these assume continuity between toxic relations at the local and the transnational level, including the scalability of locally situated bodies to prove transcontinental harm of environmental destruction.

Bodily knowledges provide the impetus for political movements to challenge hegemonic knowledge about toxic conditions (Murphy 2006). Yet, it is often recognised that the body is an imperfect, unreliable instrument of detecting danger (Spackman and Burlingame 2018; Fiske 2018; Senanayake 2020). Fiske (2018) argues that "the peculiar social authority" of bodies can be misleading due to their situatedness, and she uses this conclusion to counter the idea of the authenticity of local bodies and to insist instead on the situatedness of all knowledge. "Rather, I insist on the situatedness of all accounts: from the technical to the experiential, from relative positions of power and proximity to pollution" (Fiske 2018, 397). I take this cue to examine how the experience of middle-class, upper caste outsiders in Kabadabad arises from their differential background but is presented as a universal experience. An added complication for bodily knowledges is the nature of toxicants to settle away from the source of contamination or to linger on long after the source has disappeared, as well as the capacity of the bodies capacity to adapt, and of the senses to lull, while they become attuned to the environment (Blanchette 2019). Thus, while bodily knowledges have the potential for raising questions about order and hierarchy, they also continue to carry uncertainty that a reliance on them wishes to do away with. Following Fiske (2018), in this chapter I continue to centre locally situated bodily knowledge, but one that unsettles assumptions about power imbalances and victimhood.

For the most part of the past two decades, reporting on e-waste toxicity was an integral part of the campaigns to reduce the use of toxic substances in electronics by design and to make the US ratify the Basel Convention. In India, the same was used to launch an effective campaign directed at the government to convince of the necessity to put into place new laws that would curb the leaking of e-waste to the informal sector and toxic substances to the environment. Yet, this was not the only effect of reports on the local level. Baviskar (2020) highlights how environmental campaigns, starting in the 1990s, rather than becoming effective against big players in the polluting industries, had led to the closure of hundreds of small-scale industrial units across the city of Delhi. Those who lost out on this were the small businessmen and the workers, giving rise to what Baviskar calls "bourgeois environmentalism," in whose framework courts privileged middle class and upper caste concerns over the livelihood of poorer people. The bourgeois environmentalist discourse often urges to action and wants to re-establish a purity in the world, which is not only impossible, but is also a striving heavily charged with ethical questions (Shotwell 2016). Because of the caveat that e-waste becomes a toxic effluent when not recycled properly, the issue came to be associated with low-income neighbourhoods, where e-waste was taken apart by hand, and processed without capital-intensive technology. Like other polluting industries, e-waste workshops in Delhi were facing spates of sealing drives.

Shaheed's denial points to exactly this subversion of the more commonly understood relations of toxicity. *Kabadiwallas* denied the severity of the effects of their labour, while Sahih Kaam, as the representative of legally bound producer brands, insisted that they knew better. The contrast between *kabadiwalla* denial and scientific evidence points to the well-known axioms at the heart of knowing toxicity, sensory unevenness and politics of toxicity (Spackman and Burlingame 2018; Fiske 2018; Liboiron, Tironi, and Calvillo 2018; Murphy 2006; 2017; 2008) although in a surprising new alignment. Also, part of the challenge comes from the difficulty of knowing toxicity when chemicals often remain invisible and imperceptible to the senses. The case of e-waste markets and their particular configuration of uneven toxic relations raises the question of who, how and for what purposes is the perceptive uncertainty of toxicity harnessed? To answer this, I examine how the body has been understood in India and how that relates to reports of toxicity today.

Kabadiwalla bodies

Situated bodies in Kabadabad

Through that summer, I was often seated on a bag of printed circuit boards (PCBs) in the warehouse of Shaheed and Samir. I had come to the e-waste market following Sahih Kaam's value

chain, intrigued by their portrayal of Kabadabad as a toxic place. One day, from my perch, I observed Samir as he dipped printed circuit boards (PCBs) into molten solder to remove a small motor. Observing his hands move deftly, I fell into a meditative state following the repetitive motion, so it took a little while to notice the twitching in my face from the fumes rising from the small electric implement.

A glistening silvery blob was balanced on a small plate heated by a coil to melt the solder on the PCB. In the process, the small motor was loosened to yield without having to yank or break the plastic. At every second move the molten solder would burn just a little more than the silver lines on the back of a PCB, letting out a waft of plastic smell. It took me some time to realise the enhanced pressure on the side of my forehead that was closest to the little heater. Or was I imagining it? It must have lead in it, I was thinking to myself.

I asked Samir, "Don't the fumes bother you? Doesn't it affect you?" But my hope to elicit a similar kind of response to the ones heard in documentaries such as "Citizens at Risk" about the bodily effects of hazardous e-waste did not come to fruition. "No," he shrugged his shoulder, "I've gotten used to it, I've been doing this work since I was sixteen–seventeen."

As I sat there looking at his hands and feeling the pressure in my forehead intensify into a headache, I told him about my discomfort. To which he replied, "That's because you are a *VIP*."

The exchange left me thinking about bodies and how they become attuned to work, becoming accustomed to fumes and exhausts while my still sensitive VIP body registers the irritations. Samir disrupted the direct chemical relations that environmental advocates draw between toxic substances and bodies. In fact, while traversing different sites in Delhi, I encountered similar attitudes toward bodies changed through environmental effects. Many *Dilliwallas* (Delhi dwellers) refer to their lungs as having adapted to the constant pollution by the expression of "having Delhi lungs." While the bad quality of city air for the most part of the year prompt innumerable discussions about the wide spread of respiratory disease, Baviskar had found a similar narrative of toughening due to exposure. Yet, the full image cannot be established, because she suspects that those who do not toughen up might not make it at all (Baviskar 2022). Similarly, on a visit to a plastics market at the height of the dengue season, a colleague and I worried about mosquitoes swarming around us. When we questioned the people in the market, they referenced our "AC bodies," bodies honed to air-conditioning, as to the discontinuity that explained why we were at greater danger and why we had a reason to worry. Whether or not bodies indeed change with exposure, such attitudes question fundamental assumptions about the vulnerability of bodies. These comments question the anxieties of global and local elites and middle-class

environmentalists about the vulnerability of the poor. My body, classed together with other VIP bodies, AC bodies, bodies of the rich, had the capacity to be affected and be vulnerable.

In a reflexive turn, by reminding me of my VIP body, Shaheed allowed a glimpse of their view of other outsiders like me. The term VIP referred to my gendered and foreign body that was often classed with employees of Sahih Kaam and other outsiders of upper-caste, middle class background. I was often asked whether I adhered to Hindu customs, particularly whether I ate meat and what sort. Yet, there was an understanding of me being a foreigner, too, which was expressed by indicating parts of the city where my interlocutors would encounter foreigners. "There are many people like you at Connaught Place and Jama Masjid, but you are better than them because you wear decent clothes covering your legs and arms," Shaheed conveyed to me their family's judgement on my character. This suggests the need to examine also the situatedness of the bodies of experts, advocates and scholars, who produce knowledge about toxicity and its lived experience (Fiske 2018).

While talk about pollution among my interlocutors in Kabadabad was not uncommon, it was mostly attributed to the general state of Delhi air and coincided with times when a new high in PM2.5 levels was making the news across town (Spears 2019). There seemed to be little association with local pollution levels and with the work scrap dealers engaged in locally. Although I had heard claims also to the contrary, it was often stated that gold extraction in facilities called "labs," considered the most harmful activities in the value chain, did not happen in Kabadabad anymore, but further out towards the city border.[13] Also, I was often told that no one would tell me or show me how gold is recovered, the contrasting claims suggesting more than anything the stigma-induced secrecy that surrounds the business. Gold extraction facilities beyond the city limit became toxic effluents as vats filled with acid and soaking PCBs, sights familiar from awareness material, were emptied out into the open drains. I have never managed to check the veracity of any one of these claims either for or against. It did make sense that the most polluting parts of the scrap circuits would have moved out of the city, leaving behind largely harmless operations, such as the ones in which my friend Shaheed and his brother Samir were engaged, who, together with others like them, were in danger of being harassed by the police and of being sealed.

At the same time, Parvez, a more concerned young e-waste dealer who sold CPU chassis to Sahih Kaam, told me that the *naala*s, the canals criss-crossing the neighbourhoods and acting as sewers, were so acidified due to pollution that there were no mosquitos in the area. Mahmood, Parvez's

[13] A claim also relayed by Corwin (2018b).

aggregator partner, told me that he had been previously going to work there, "where PCBs are blasted [*jahaan PCB funkte hai*]," an area also further towards the city limits. He quickly, within a week, gave up the work because of its effects on him—he could not stand the fumes. *Jahaan PCB funkte hai* was a place that figured in talks with other e-waste dealers as a place of great bodily harm. When in another conversation with Samir I suggested that I would like to go for a visit, he told me not to visit with "my constitution." The concern with the toxic place elsewhere also shows that bodily harm was more strongly associated with certain processes in the e-waste trade, than others. E-waste dealers did not easily draw strong links between their trade and the state of affairs in the area, but would locate e-waste exposures at places elsewhere, at a distance from their living and workplaces and as a result of certain aspects of the dismantling process.

There were people in Kabadabad, who were more equivocal about the harms of e-waste work in relation to their bodies; they just did not happen to be *kabadiwallas*. Whether or not harmful substances and pollution were acknowledged, was also dependent on who I was talking to. When I first arrived and introduced myself and my project to my neighbours in the apartment building, my immediate neighbour Raees Khan, an out-of-work property dealer, told me about his asthma and blamed the scrap dealers for it. He pointed to his one side and then to his other to indicate the direction from which late at night the smell of burning plastic wafted through the windows. "They burn wires at one or two o'clock at night in secret, because they are hiding from the police." Soon after, I also discovered the birds-eye view of a warehouse across the street with its open courtyard full of broken CRT monitors. The knowledge thus acquired then changed the way in which I looked at the tandoor oven that was wheeled out of the shopfront next to the warehouse's doors every day to make hundreds of fluffy, pale-yellow flatbreads to accompany the meals of neighbouring residents going by the name *hotel ki roti* [flatbread from a restaurant]. When Raes Khan's daughter complained of a stomach-ache and her mother chided her for having a taste for *hotel ki roti* instead of homemade ones from flour from the mill, I could not stop myself from gently suggesting that they should perhaps not eat roti from that tandoor oven. In fact, stomach-ache and digestive disorders were symptoms by which lead poisoning could be identified.[14]

There were also other stories. Jaleel, a man whom I met sitting in Shaheed's warehouse and who will make an appearance in chapter 5 again, told me in an offhand manner about having used to reclaim gold. The reason for leaving behind that business was that he used to do it with his brother

[14] I learned the typical symptoms from Dr Chadda who runs a charitable hospital in Jahangirpuri to treat cases of lead poisoning close to a battery making plant. He had also provided the crucial case studies to support Toxics Link's campaign to the government to ban paint containing lead. This is how I got to know about his clinic, where all patients came with the complaint of a stomach-ache.

but gave up after the latter died. He died of, "high blood pressure; blood went up into his head and got stuck (*jam gaya*)." And while the association is suggestive, Jaleel did not make the connection. Furthermore, the presence of multiple environmental stressors and the unhealthy lifestyles do not lead to conclusive explanations. Unfortunately, there exist no clinical studies on the effect of toxicity on *kabadiwalla* bodies in Kabadabad. Due to the dearth of evidence on the life expectancy of waste workers, the rates and reasons for morbidity remain obscure. To get around this, I had tried to collect evidence from local doctors based in the area, who did not seem to be any wiser. One doctor, whose clinic was opposite the house where workers often loaded broken CRT monitors, broken glass mixed with lead powder, told me that about once in three months someone comes to him with burn marks, but that was it. Lead dispersed in the air did not appear to reach the crucial threshold of sensibility.

The dearth of evidence is not unrelated to the defensive attitudes demonstrated by Shaheed and Samir in the previous vignettes, which also makes it hard to collect evidence for toxicological studies. The fact that these disconnected traces of evidence are not converted to coherent narratives is symptomatic of the uneasy relations of the *kabadiwallas* to power, for punitive action would hit them first and hit them the hardest. There is also evidence to suggest that *kabadiwallas* live within a local "ecology of harm" that does not tally up with the scientific and environmental understanding of pollution. This pushes me to enquire more into the local understanding of toxicity and pollution (Arnold 2016). Shaheed and Samir's reactions also emphasise a personal approach to harm which resonates with the South Asian understandings of the body and its relations to the environment.

Caste, bodies, and substance transfer in the e-waste value chain

Shaheed's reference to Kabadabad as the *gaon* in the beginning of this chapter invokes Valentine Daniel's (1984) analysis of the Tamil concept of *ur* used to refer to the village. As mentioned above, the fact that Shaheed referred to this densely populated urban area as "the village" was highly unusual and left me puzzled at first. Literally *gaon* in Hindi means village. In Delhi, a megacity giving shelter to millions of migrants, gaon had come to stand in for the place of origin. When one asks any city dweller of Delhi the common question, "where are you from?" this is usually phrased as "where is your village [*aapka gaon kahan pe hai*]?" So also, when people wanted to know where I was from, they asked me where my village was. Similarly, when Shaheed would talk of his *gaon* he usually meant the western Uttar Pradesh town Meerut, his place of origin where he was born and brought up, and hardly a village with its population of 1.5 million. Daniel (1984) showed that the Tamil concept of *ur* means more than the physical space of the village. It indicates an embodied

sense of belonging, where living in the village means being affected by the qualities of its soil through eating the food grown in the fields and drinking its water. Included in this cosmology is the notion that the environment around one's self is a flow of "differentially valued and ranked substances" which have the capacity to affect the body (Daniel 1984, 2). In the ethnosociological approach, communion with the different substances is the basis of caste hierarchy, though Daniel emphasises that caste is but one manifestation of the system of ranked substances.

These perspectives highlight the situated nature of not only bearing witness to pollution, but also of knowing toxicity in place. Kabadabad, a tiny speckle in the midst of the dense urban sprawl that makes up Northeast Delhi and where the majority of Delhi's population lives, was not experienced as much more polluted than the neighbouring areas. Its inhabitants, recent migrants to the city, had to adjust to life in the megacity and, as a result, had notions of being in a different environment. Shaheed told me that he would fall ill regularly with coughs and chills in the first few years when he returned to Kabadabad after longer stints from his village. He reiterated, "The air and water of this place did not agree with me [*Yahaan ka havaa-paani mujhe suit nahin karta tha*]." The *havaa-paani* means more than what the English translation "air and water" suggests; it means precisely that situated belonging through the communion with the local substances that Daniel (1984) describes. The comment also included the unsaid claim that, having moved permanently to the city, he had gotten used to the *hava-paani*, the "air and water." Through the ingestion and absorption of these substances, persons are affected by their surroundings, so they may be considered to be compatible or in disequilibrium with the environment. An understanding that would explain Shaheed and Samir's comments on my "personality" and "constitution" and their incompatibility with certain sites that were considered more toxic than Kabadabad. This system of substance transfer also underlies the caste system; people can be ranked according to their communion with different substances, but one caste can also be said to be more compatible with the soil of the village than another.

The permeability and malleability of bodies in Delhi can be seen to be similarly inflected by caste-based notions of substances transfer, even if not in such a clear-cut way. Daniel follows McKim Mariott (Marriott 1968; Marriott and Inden 1977; Marriott 1976) who was interested in caste ranking in village societies, based on the exchange of biomoral substances in the village. In tracing a range of exchanges, Mariott worked out a schema of exchange relationships, where caste ranking was based on the willingness to receive *kaccha* (raw, uncooked, impure) substances. The provision of services by one caste to another, such as barbers, indicated a willingness to receive cooked food from them and therefore indicated subservient relations. At the same time, barbers could refuse to provide the same services to those castes which they considered lower than themselves. Yet,

many argue that modern-day chemotoxic relations do not overlap with the effects of exchange in biomoral substances (Pathak 2020a). Nor is toxicity assumable in the schema of purity and pollution, the basis of Dumontian (1980) conceptions of caste. E-waste and the toxic substances that escape from it during processing are not included in Muslim ideas of purity and pollution. Yet, Shaheed's denial of pollution in the village, and Samir's identification of my body as different and vulnerable because of not having the long-term experience of exposure bear a promise to untangle the two. These contradictory reactions to the supposition that there might be pollution point to the fact that chemotoxic effects do have the potential to produce negative value by adhering to places and devaluing identities.

Caste and caste-based notions of difference change in the city, even though they do not entirely disappear. Hierarchy in the city must take into account the possibilities provided by class mobility. While Shaheed and Samir were proud Maliks belonging to the caste of Muslim *telis*, caste did not appear as a language of discrimination. When asked about inequality or discrimination, the Maliks claim that there is no discrimination, due to the egalitarian tradition of Islam. The Maliks' recognition of themselves as a caste or a *biradari* (clan/ethnic group), is based on marriage practices and their common occupation (see the previous chapter; "Maliks had grabbed this business. [*Malikon ne yeh line pakad liya hai*]"). Some ritual practices, such as customs around marriage, also continue due to the Maliks' conversion from Hinduism a few generations before, as I was explained by another Malik interlocutor. The practice of caste among Muslims has been at the centre of debate in scholarship but the details of that debate are not relevant for the argument to be made here. Suffice it to say that scholars agree that there is evidence among South Asian Muslims of social stratification akin to caste, which shares concerns with Hindu caste practices in terms of hierarchy, intermarriage, and sometimes commensality. However, caste among Muslims is also different inasmuch as it is less a complexly developed system and lacks scriptural legitimacy (Lee 2018; Ahmad 2018). The marginal status of certain Muslim castes has been recognised by the state following the recommendations of the Mandal Commission in 1980, and castes like the Maliks have been included among the Other Backwards Classes (OBCs).[15]

Roberts (2016) shows how inhabitants of a slum inhabited by Dalits, meaning former untouchables, refused to acknowledge that their marginal status in the city was due to caste discrimination. They rather preferred to express themselves in the language of class, to maintain

[15] (See footnote 6.) Muslims have two main caste categories, *Ashraf*, meaning "noble" and used by those who trace their origins to Central Asia and the Middle East and converts from high castes. *Ajlaf* means "degraded" and "unholy," and refers to middle-caste and lower-caste converts. The Maliks are middle caste converts with ritually clean occupations as oil pressers.

the appearance that there was no caste in the city. Yet, Roberts found that to drive home the fact that "caste in the sense of ritual rules governing everyday interactions is absent" (Roberts 2016, 62) they rather made the difference between "the poor" and "the privileged." This highlights the point that caste is not exclusively a ritual hierarchy. "It is a complex social order that is multiply determined, including by endogamy and heritable political-economic roles, and by control over resources" (Roberts 2016, 62). Roberts' point illuminates how caste distinctions are made by people in the city and how to recognise them. Shaheed and Samir's comments point toward a more embodied difference that shares much with substance transfer-based caste ranking. Elsewhere, Roberts argues based on Guha, "Purity is therefore best understood as an idiom through which status is expressed, not its essence, as accounts that see caste as a ritual order would have us believe" (Roberts 2015). In the city, where class mobility provides more opportunities to escape the ritual order, the refusal to be characterised as impure can be seen as revealing of structural relations.

The English acronym 'VIP' used to refer to me by Samir highlights the socially structured experiences of bodies in the city. In everyday use, VIP was used to refer to neighbouring Hindu areas to emphasise the inferiority of Kabadabad. The difference between Kabadabad and the neighbouring areas became a topic of discussion when, after the first 3-4 months of my fieldwork in Sahih Kaam's office, I announced my intention to find a room in the e-waste market and move there. While first Manish, my local Sahih Kaam contact, and Shaheed were forthcoming with their help, once they had time to think about it, they tried to talk me out of it. Shaheed said that having observed me he found that "my personality" would not make the area suitable for me. And that I should move to a "VIP area," such as the one where Manish lived. Salman explained, "There the houses are tiled, and people sleep on beds unlike us who sleep on the floor." Yet, his pronouncement was rather ironic, for most of Shaheed's family slept on beds and one of his brothers lived in a fully tiled house. Once I visited Manish's place, I could ascertain that his area was also only slightly better provisioned by infrastructure than Kabadabad. At the same time, by making a remark on my VIP-ness not only did Samir place himself at an inferior position in comparison to outsiders, such as Sahih Kaam employees and me, but he also challenged the continuity between his experience in life and mine. We just didn't have the same bodies. The reference to others as VIPs demonstrates an awareness of Maliks' marginal position—as Other Backward Class (OBC) Muslims, recent migrants to the city, and inhabitants of devalued neighbourhoods.

Such hierarchies create hard distinctions, such as between VIP and e-waste dealer, distinctions that create bodies unlike each other, also implying epistemic breaks in knowing toxicity. This epistemic

break highlights the need to examine the bodies through which knowledge is situated, whether of locals or of experts. The difference-making between bodily experience of their own and that of the outsiders made me question what goes on in awareness sessions, where the effort is to make a continuity between the audience's bodies with vulnerable *kabadiwalla* bodies in representation.

In representation

The issue of Kabadabad's toxicity and its relationship to *kabadiwalla* bodies had much less uncertainty about them in awareness sessions conducted by Sahih Kaam. Spreading awareness about improper recycling and the toxicity released through it from e-waste was also legally mandated but the law did not put a number to it. There were no targets in delivering awareness, only in collections. Still, Sahih Kaam had built up a significant repertoire of delivering awareness sessions in schools, to bulk consumers, and resident's welfare associations (RWAs). It is worth recounting here at length a part of one awareness session for the techniques that were used to drive home the effects of toxicity.

On one hot Delhi summer day, I accompanied Dipesh to deliver a bulk consumer workshop in Noida, a satellite town of a mixture of residential areas and corporate office parks. Bulk consumer workshops are part of Sahih Kaam's business of fulfilling producer responsibility as the law mandates that electronics producers need to spread awareness of proper post-consumer waste recycling. After two hours on the metro, having changed trains three times, we found the cool of the air conditioner inside the office building refreshing, even if we stood the chance of catching a cold. The marble floors and shiny glass surfaces provided a welcome change from the gritty air outside.

As part of the carefully designed programme, Dipesh's awareness session switched between emphasising the toxic chemicals and the toxic effects of electronics as well as the exponentially growing quantities of e-waste. Then, to clinch the deal about the harms of e-waste, Dipesh showed the video "Citizens at Risk: How Electronic Waste is Poisoning the Path out of Poverty for India's Recyclers" uploaded to YouTube by Chintan (n.d.). Chintan is an NGO that has been at the forefront of organising waste pickers and campaigning for inclusive solutions to the waste issue. In contrast to Toxics Link which laid more emphasis on proving e-waste's toxicity and reporting on the state of the informal market, the focus of Chintan had been to empower waste workers. As part of this endeavour, they also provide awareness sessions and e-waste pickup from residents' welfare associations (RWAs), similar to the work done by Sahih Kaam. At the same time, they had been producing awareness material since their entry to the field since 2006, which is how I came to read in the first place about the e-waste markets in Delhi (B. Chaturvedi and Bhardwaj 2013;

Chintan and Damage Control n.d.). The YouTube video, the result of an earlier collaboration with the Silicon Valley Toxics Coalition, is a good place to begin to analyse the way bodies are enrolled to demonstrate e-waste's toxicity.

Starting with a low angle shot of one of the e-waste markets in Northeast Delhi, the camera opens with a closeup on a swarm of flies sitting on the concrete, then follows the feet of a rickshaw puller. "This poor derelict neighbourhood is a part of Delhi, but with its own direct connection to the global marketplace. […] This is where the world's computers come to die." (Chintan n.d., 0:19) The feet are that of a child, scrawny and barefoot, and a mournful tune accompanies him as he picks his way through puddles in unpaved, *kaccha* streets with computer waste piled on either side. The frame cuts to offices with lines of computers and workers sitting in front of them, the images pulsating the post-liberalisation boom in customer service provision. The music changes to a rhythmic beat suggestive of the dynamism and fast-paced growth of India's IT sector. These are interspersed with images of busy servers flashing lights and figures of computers sold in India and the US not only to drive home the extent of the e-waste problem today, but also tomorrow. "More electronics, more e-waste," reads the text on the screen for only a brief second, but leaving a lasting impression (Chintan n.d., 1:55). And while India's developmental path is pushed forward by a government agenda favouring corporate interest, it is the poor who take it and break it as a "path out of poverty." The film highlights government and corporate complicity in pushing people to have to make such a horrible choice between health and making a living.

The film presents one such e-waste processor, Fazloor Rehman, who speaks on camera about pollution in Hindi, while a goat keeps nibbling at his ear, "Working with chemicals is very dangerous. I've got no other choice, that's why I am doing it. Well, brother, that's it; you get a little dizzy in the head, there is no pressure. But if the government doesn't care, so what will I do?" (Chintan n.d., 3:40).[16] In the meantime, the English subtitles tell a slightly different story: "Working with chemicals is no good. It puts one's life in danger. There is a burning sensation in my chest, there is a chance that my lungs could be ruined. Nobody cares for us, so what can we do?" The NGOs narrative echoes the age-old one known from mining (Nash 1979), that you either eat and the mines eat you, or apart from the fact that Fazloor Rehman, just as the others, are self-employed and lack organisation.

Yet, the tone of Fazloor's voice indicates an uneasy relationship between the testimony and the video's message as does the difference between the Hindi original and the subtitles. Fazloor is

[16] *Chemical ka yeh kaam bahut khatarnak hota hai, majburi hai kaam isliye kare. Bhai yahi hai, dimag ghumak mein chakkar aave, pressar nahin aave, jab sarkar koi dhyan nahin karte, to kya karega*?

clearly reluctant to talk about pollution and its effects on his body. His testimony, as he stoops over to melt a pot of integrated circuits (ICs) with a blowtorch, seems to be just as reluctantly given as the ones I managed to extract in the e-waste market. The mismatch between speech and translation is indicative of the filmmakers' problem as much as of the political and socio-economic issues of representing morally legitimate suffering subjects (Ticktin 2011). It appears that the way Fazloor presents what happens to his body, getting dizzy in the head and feeling low blood pressure, does not make enough of an impression. The tone of resignation is written out of the subtitles overriding Fazloor's voice, as is his blaming of the government's lack of care for his difficult position.

After the scenes from the e-waste market, the film moves on to a place half an hour away out of the city where copper is extracted from printed circuit boards by soaking in vats of blue liquid—the infamous acid baths. The lanes are littered with the remnants of the extractive activities, charred fiberglass and PVC, a scene that occasions the recounting of chemical transformations that result in the release of toxic substances in the environment. The scenes are indeed harrowing, yet people are not coming forward to give their testimonies. At this point, the voiceover switches to relaying the experiences of the film-making crew, which is another characteristic move of films demonstrating the harms of e-waste: "The air was pungent, our eyes and noses were itching within minutes, no one else showed signs of discomfort, they had probably never had the luxury of a clean work environment" (Chintan n.d., 8:22). Although we do not see the bodies of the film-makers, as we do not see the bodies of various types of experts who produce knowledge about e-waste's toxicity, the evidence marshalled includes their experiences too. The invocation of the irritations of the film-making crew, even if presented in a disembodied way, works to highlight how expert and environmental advocacy knowledge is also situated through bodies (Fiske 2018). If workers do not show signs of such bodily discomforts, then how would they relay their experience?

For the rest of the video, we see people engaged in different parts of the dismantling process, hammering away at parts, burning integrated circuit boards (PCBs), women picking away with bare hands at PCBs soaking in acid. The voiceover tells, as a matter of fact, of chemical reactions and chemicals released in the processes seen on camera and details the way in which hydrochloric acid burns the lungs or flame retardants may be linked to reproductive issues. We are assured, all this harms the workers, yet apart from Fazloor's extracted testament, most workers remain mute in the face of the camera.

Then Dipesh switches off the video and proclaims, "The situation is even worse now [*Ab haalaat aur bhi kharab hai*]." The bulk consumer audience, which so far had been giving out a heavy air of disbelief, and what-have-we-got-to-do-about-all-this, becomes visibly animated and the words escape many mouths, "very interesting."

I understand the awareness sessions conducted by Sahih Kaam, described in the previous session, as an exercise to inculcate an embodied experience of e-waste's toxicity. However, the efforts are yielding mixed results as ideas about toxic substances nestle into different narratives. When Dipesh presented "Citizens at Risk," the audience responded to its haptic visuality (Marks 2000) and were animated by a moment of discomfort. Dipesh staged a story within the story, which allows for the kind of multi-scalar inquiry Fortun proposes for ethnography in late-industrialism (2012). The film frames the bodies of e-waste recyclers as morally legitimate suffering subjects by framing their work as a hard choice between poverty or poison. If only governments and corporates had cared more and taken action, the situation could be changed. The film is thus the medium through which *kabadiwalla* bodies can be scaled up and become transported to a wider audience to invoke "a moral imperative to relieve suffering" (Ticktin 2011). The Noida office worker swaddled in air conditioning was forced to encounter the body of the e-waste recycler in lower-middle class neighbourhoods in Delhi. The moment of discomfort is premised on the idea that toxicity produces the same bodily effects given the continuity between bodies, thus the ones presented on screen are intended to bear witness to "slow violence" (Davies 2019; Nixon 2011).

Dipesh's use of the film's capacity to create a continuity between bodies, to evoke affect and create effect on a sensory level, draws on the mimetic faculty and the force of sympathetic magic (Taussig 1993). Mimesis helps unpack the often glossed-over process, through which knowledge about toxicity is produced and then transmitted, providing an extension of the sympathetic magic of substance transfer in Valentine Daniel's formulation (1984). Taussig defines the mimetic faculty as "the nature that culture uses to create second nature, the faculty to copy, imitate, make models, explore difference, yield into and become Other" (Taussig 1993, xiii). He highlights the practice of creating likeness and explores the sympathetic magic enacted through the making of copies and the effects of these on audiences. Further, Taussig's invocation of Frazer's concept of sympathetic magic carries out the important function of linking images with their audiences. "[T]he mimetic faculty carries out its honest labour suturing nature to artifice and bringing sensuousness to sense by means of what was once called sympathetic magic" (Taussig 1993, xviii). I take this definition to understand narratives of e-waste's toxicity not simply as discourse, but a representation of reality by particular actors based in their own sensory experiences and intending to affect. A recourse to the concept of mimesis allows me to think of the relations and reactions between bodily, sensory

experiences, and biochemical data of the behaviour of chemical substances and particles, compounded by political expediencies to produce advocacy knowledge.

Despite awareness that toxic substances can often be imperceptible, without smell or visible presence, it was exactly such sensory experiences that were sought and held up as evidence of the hellscapes e-waste produced across the world. Although accounts, reports, and scholarly explorations of e-waste's toxicity are aimed at advocating for less toxic design, clearer laws, and proper enforcement, scrap dealers in Kabadabad (and their colleagues world over) bear the stigma. In the next section I examine how the kind of places one dwells in and the kind of context one labours in define the body's substance and determines the sensory experience.

Interpreting Sensory Experience at Home and Elsewhere

During my first trip to Kabadabad, I was attending a health and safety workshop, held in partnership with international organisations including the ILO (International Labour Organisation). Curiously enough, despite the centrality of toxicity to narratives of harm around e-waste work, the workshop did not mention toxicity at all. Rather, the suggestions were about keeping warehouses neat, and the space clear for thoroughfare, about working at a table etc., most of which were not implementable at all in the cramped spaces of the *kabadiwalla* shop floors.

My planned visit occasioned a surprising set of comments from my co-workers at Sahih Kaam. They illustrated the complicated relationship that office-based employees had with the e-waste market. Lata, one of the young, foreign-educated employees, who had been at the company from the beginning, and was developing awareness curricula, told me laughing that I should prepare for the onslaught of toxic substance. She warned me to expect that allergic reactions will drive me out of the area and that I'd better buy some antihistamines. She then turned to a colleague and, together, they told me the story, continuing to giggle, about the ILO representative, when the last time he went for a visit to Kabadabad, and had to leave the area because of his strong reaction. Now they wondered how he was going to deal with the visit occasioned by the health and safety workshop. Satishji (an ex-field operative and member of the operations team) is already taking some pills in preparation, they said. Although Lata's work, similarly to Dipesh's, centred around knowing and presenting the state of Kabadabad market, most employees working in awareness and business development roles only visited "the field" once in a while during events, such as the health and safety workshop, or when they had to show visitors around (see the next chapter). Thus, they had detailed knowledge of the place but largely lacked the extent of bodily intimacy

that Shaheed and Samir had, creating a situation where high pollution levels took centre place in their imagination.

I, in contrast, was underwhelmed by my first experience of Kabadabad. There were no reactions, no need for antihistamines, no itches, no stinging in the eye, only the sensory onslaught of a densely populated suburban Delhi neighbourhood.

I took the metro and, once I was out of the station, I called Satish on arrival at Kashmiri Gate, where he would navigate the *autowalla* (the driver of the three-wheeler for hire). Later, this became a routine, though exhausting, commute. The access road to Kabadabad, a couple of kms off the main thoroughfare, was in repair for most of my fieldwork. Through the next six months, I regularly passed this bottleneck thronging with cycle rikshaws, motorised three-wheeler taxies called autos, cars of different makes, buses and trucks of different sizes, and motorbikes carrying anything from goats to entire families. The bottleneck was a permanent fixture on the corner partly caused by electric rikshaws and autos waiting to fill up with passengers who'd share a ride for as little as 10 rupees, and partly by the large number of pedestrians circumnavigating the rikshaws that were waiting to leave. The dense entanglement of bodies, human or otherwise, and metal vehicles made it appear that the road beyond would be congested, scaring off taxi drivers. Every time I passed through the first stretch of the road was in a different state of disrepair. That first time the road appeared to be made up of mainly potholes. Over the months it was unevenly filled with construction waste (*malba*), and with rocks the size of a ball or two rolling around in the traffic. Before concrete was laid, during the monsoon, the road would turn into a brown sewage- and rainwater-filled trench. While traversing the scene, at those times I worried about the chemicals that may have been sloshing around my feet, mixing with faeces and other bodily discharges. The water, the *malba*, the traffic congestion often diverted my shared rikshaw to the neighbourhood's small gullies, revealing other second-hand industries apart from scrap trade. Once the road began to be fixed, it was laid in stages, which made the left side of the road covered with a smooth concrete layer, while the right side continued to be bumpy and dusty and a good thirty centimetres lower than the fixed bit, which made overtaking other rikshaws, bullock carts, bicycles and other moving bodies a more than thrilling affair. On that first day, the road's various states of disrepair heightened my sense of arriving in a secluded and different place before the anti-climax of arrival.

The difficulty of access reminded of Roberts's (2017) physical manifestation of toxic boundaries. Such barriers to access would strengthen the feeling of the area's remoteness and make it into a place of elsewhere, despite being situated firmly in the metropolis. Most employees working in

awareness and business development roles had the opportunity to visit "the field" only rarely. Yet, many of them, graduates of domestic and international environmental science programs, expressed a desire to gain more first-hand knowledge and to have an ear to the ground (more on this in the final chapter). Everyone was encouraged to go for a visit at least once, but tight schedules and the constant sense of urgency in their everyday tasks prevented many office-based employees from making the trip. Male employees were often given tasks that gave them opportunities to visit regularly. This was no accident, the start-up founder explained to me when I began to organise a place to stay at the market: it was no place for a woman, he warned me.

Sahih Kaam employees, from middle-class backgrounds, being used to working in airconditioned office buildings, found that, once they were in Kabadabad, their senses were assailed and overwhelmed. They connected such bodily irritations to their knowledge of e-waste's capacity to leak and cause harm. Their bodies learned to recognise the dangers and harm resting in electronic items through a process akin to what Latour (2004) described as "acquiring a nose," although working on levels of all sensory faculties. Recognising toxicity required a training of both cognitive processes, familiarising themselves with the literature on e-waste's toxicity as well as exposing their bodies to the informal e-waste market. The smell of burned plastic mingled with the sour odour of open sewers, visual cues such as the sight of streets piling high with rubbish were related to their prior acquired knowledge about the chemicals that are unleashed by improper recycling of e-waste. They were to convey these knowledges in awareness sessions to the wider electronics-using citizenry which, in the absence of a medium that carried smells, were done through showing the video "Citizens at Risk." Bodies and their sensory experiences are not only a matter of biology but are determined by socio-economic backgrounds and self-cultivation.

In the eyes of middle-class PRO employees, the infrastructural breakdown typical of Delhi's urban sprawl were a sign indicating Kabadabad being a slum. Sahih Kaam employees also talked of Kabadabad as slum, without considering the neighbourhood's actual status, legally recognised by the city administration. It was enough to take in and interpret the sensory cues and pronounce judgement on the area. All this demonstrates the strong sense of aesthetics that underpin "bourgeois environmentalism" (Baviskar 2003; Sharan 2014; Ghertner 2015). Industrial effluents and pollution has been a central topic of city planning since Delhi became the capital of India and had to become a model city that stood in for the nation (Khilnani 1997). In the following decades, Delhi was governed by a series of masterplans, under which Delhi's zoning plans created pockets of legality and illegality, including carrying on polluting industries in areas earmarked for residential use. Even today, similarly to how Baviskar details (2020), despite advocacy work and media representation being directed at the government at a higher level, publications and exposés on the

state of Delhi's informal e-waste markets were often followed by police crackdowns. "Sealing drives" were an everyday occurrence under the legal framework of such zoning laws for carrying on polluting industries in residential areas. Thus, Dipesh, Lata and other outsiders, such as NGO workers, filmmakers, and advocacy people, drew on a variety of available tropes to give affective force to their awareness materials and, in a process, work to establish linear causal relations between the e-waste trade and its effects on the environment. The tropes that were reproduced mimetically through the images of kids and women picking over the remains of e-waste added to the force of sympathetic magic to work on Lata and Dipesh's body.

I suspect that office based Sahih Kaam employees also had something to do with Shaheed's and Manish's attempts to talk me out of moving in, based on judgements on my character. When discussing my decision, Praveen, responsible for planning collections and handling payments to *kabadiwallas* told me straight, "Don't move there, you will regret it. Have you not seen how they live, what their society is like [*vahan ka society kaise hai*]?" What he exactly meant by that has never been made clear to me, I was just supposed to understand without any further explanation. Satkar, the founder, also warned me of all kinds of dangers, using mostly a vague language which implied potential risks of being cheated on account of being a foreigner and perhaps being violated on account of being a woman. Kabadabad's bad reputation was widely shared, not only by those who were familiar with the e-waste market as a toxic effluent. Around the same time, when starting to visit Kabadabad regularly, I met a group of young, middle class Muslim men from the old, historic city of Shahjahanabad, usually referred to as Old Delhi (which ironically has the official status of a slum). They also warned me of the dangers lurking in Kabadabad, where a mafia was supposed to be operating an arms dealing racket and other dark trades. Thus "the market" was not just a distant place of toxic urban wasteland, but toxicity was assumed to go hand in hand in that place with multiple forms of depravity and dangers. Correspondingly, in the imagination of the PRO employees, Kabarabad became a dangerous, toxic elsewhere, where you better took off your gold chain and kept your cash in the bank, if you wanted to enter.

The number of awareness sessions attended, and articles read on e-waste's toxicity as well as Sahih Kaam employee efforts to discourage me from moving in could not deter me. However, they had enough of an effect to make me move around in Kabadabad with a heightened awareness of being surrounded by toxic substances. For example, I was more reluctant to buy vegetables off the street and in the local shops, though these may have come from the same sources as vegetable carts in the city elsewhere. At the same time, I was also very well looked after by the families that I had gotten close with, they provided me with regular lunch and dinner, which I would not and could not refuse. For weeks, I kept surreptitiously peering through the gates of houses, and when they

revealed industrial units on their ground floors, I imagined to be glimpsing into the infamous labs aimed at extracting gold. Yet, it turned out that several of the buildings housed tailoring units on their ground floors, with the mysterious lighting patterns taken for a "lab." Through my close cooperation and due to longer periods of time spent in Kabadabad, I found out that, in the eyes of my e-waste dealer friends and interlocutors, the various dangers outsiders described could not be farther from the truth. I was often told that Kabadabad was a "family area," where everyone knew each other and cared for each other, where one could walk down the street late at night and no one would harm them. This was contrasted to the neighbourhood next door, where people received stares and where there was no cohesive community. The community's reliance on e-waste for their livelihood and "for a way out of poverty" was perhaps one reason among the many, which made it harder to recognise or even pushed them to deny the polluting effects of the work they are engaged in. Yet, there may be something more to it, too, when we consider how hierarchies operate in the urban context of Delhi.

My differently classed, gendered body made me stand out in such a tight knit community but, whatever distance this may have created, it was bridged due to my decent comportment mentioned above as well as the discussions on my dietary practices. Once they learned that I was a meat eater, and one who ate "*bade ka*" (Hindi for "of the large one," meaning the meat of the buffalo and, by extension, beef) they warmed quickly to me. Samir reacted with a story of the *kasai* (butcher) back in the *gaon*, having been shot in the leg several times, indicating the political context of the beef ban and emphasising the importance of the fact that they had not found me a vegetarian. However, I got into a great deal of trouble when, in the middle of an exhilarating conversation about ritual pollution, I was asked whether I ate the "*chota janvar*" (the small animal). It took me a while to realise what they were asking and when I did, I exclaimed, "Ah yes, the pig! I do eat pork and it is not even such a small animal." As a result of this incident, I became a persona non grata in the family of Salman and Shaheed. I was explained that this was the reason why the women of the family "turned their faces" when they saw me, signalling disgust, and I would have done better lying about such things. The family council, having consulted the mullah, decided that I was to be invited only once a month or once in two months, and I did not want to risk seeing the look on the faces of the women again. Although I lost access to the family with which I was building up close relations, the incident alerted me to local understandings of pollution. Ritual pollution was certainly different from chemotoxic substances, the disgust induced by the mention of pork did not seem all that different from the outsiders' reaction to Kabadabad's infrastructural breakdown and the perception of toxicity. The work of spreading awareness in this light appeared as a practice trying to suture the embodied reaction of middle-class, upper-caste electronics users to slums and

its inhabitants with their awareness of e-waste as a toxic effluent. That pollution, whether ritual for them, or scientific for "us" outsiders, was a deeply embodied experience.

Joel Lee's redefinition of caste as an affective order helps in recognising what remains disawoved in these judgements. Lee (2021) takes the Hindi concept of *ghrna* (disgust) that emerges ethnographically out of his engagement with ex-untouchable Dalits in rural and small town Uttar Pradesh, to argue for an affective patterning of caste discrimination. He finds that disgust, "an essential element of caste habitus" (2021, 316), is expressed usually in response to bodily discharges and it serves as "the boundary separating touchable from untouchable" (2021, 314). He highlights how disgust is not the result of biological function but of socio-cultural conditioning. While the Maliks are not quite untouchables, and no one in the field used the word disgust, Lee's theorisation helps to establish the connection between the transfer of substances, whether ritually or chemotoxically defined, and caste in Delhi. For "the socio-moral domain borrows its vocabulary from objects material revulsion," (Lee 2021, 314) and "disgust depends on infrastructurally achieved indexical association" (Lee 2021, 315). This formulation helps unpack the process by which the visual cues of deprivation mingle with the danger of chemotoxic substances to invoke the sense of a wider danger. None of it is expressed in the language of caste or caste discrimination, nor in the language of ritual pollution, yet, identifying what is disawoved is where Lee's intervention is the strongest. Attention to negative affect, *ghrna*, disgust and its versions, allows for an interpretation of caste as a negative value settling in the form of toxicity and pollution on the periurban e-waste market landscape and on the people who inhabit it. As B.R. Ambedkar's (2014) criticism of the caste system reminds us, caste is not a division of labour but a division of labourers, precluding the possibility of a "consciousness of kind." (ibid.). This also alerts to the fact that Shaheed and Samir's insistence on our bodily difference can be interpreted in wider social and cultural structures. More than that, VIP life and all its trappings were also understood to make for different kinds of bodies. The effect is not unlike notions rooted in the caste system, an expression of radical alterity, which also determines the process of knowing toxicity.

Displacing toxicants elsewhere

At the heart of my interlocutors' various experiences, there also appeared a series of displacements in locating toxicity. By turning the problem around, Samir's representation displaced my concern for his well-being to identify my vulnerability. As he distinguished his body from mine, due to the work he had been doing since he was a teenager, he pointed towards the unbridgeable gap between his and my experience of toxicity. With the same move, he also undermined the representations of e-waste workers as toxic suffering bodies. He asserted his voice, through his representation of

my body as not yet used to the environment, and the exposure resulting from his work and as still capable of bodily discomfort. Through this example, I had shown that privileging local bodies in gaining knowledge about toxicity is not a straightforward affair. In fact, toxic relations may produce attachments or life situations where attunement to the "chemical sublime" (Shapiro 2015) does not cohere as a narrative and a local vernacular of harm. Here, privileging local knowledges may create a problem when locals are part of relations that are not encouraging for learning to sense and express sensory experience of toxicity.

While Lata and Dipesh found it useful to locate e-waste's toxicity in Kabadabad, yet conversations with friends in Kabadabad pushed me to think that the toxic is elsewhere, until perhaps it cannot be ignored in the here and now. Shaheed and Mahmood would warn me against the place on the Delhi border "*jahaan PCB phunkte hain*," arguing about the effect that an exposure there would have on my body. Though perhaps they were also trying to keep me away for reasons of secrecy, too. This displacement works, rather than through a singular move of assertion of representation of one people over the other, through gradations of displacements depending on the scale of analysis. Illustrative of the point is another one of Lata's stories, in which she talked with glee of the way an unidentified French man, who was to come for a longer stretch of time to Delhi, was forced to return to his home country within a few days of his arrival, because he developed a throat infection due to the level of pollution in the Indian capital. In fact, in certain representations, the whole of Delhi appeared as a toxic gas chamber on most days of the year, giving cause for concern to my loved ones back home, too. These gradations of displacement highlight not only the need to consider the way bodies situated in place offer perspective on toxicity, but also the role of detachment in the production of knowledge (Candea et al. 2015a). The proximity of and distance from places of toxic exposures also make sense of bodily, sensuous experiences and reflect on how those in turn play into different representations of toxic relations.

Conclusion

Shaheed, it turned out later, was well aware of how the e-waste trade was represented in the media—including reports about hazardous backyard operations, burning cables, acid dipping and employing child labour. In a recent phone conversation, two years after I had left the field, he told me that in the beginning when I had first arrived people showed him articles on the internet that journalists had written about e-waste recycling. He was warned that I will write similar things. In our phone conversation, he expressed certainty that since we had become close (*lagav ho gaya*), and I have seen that they do not use child labour, I will not be writing any such things.

In this chapter, I presented the various views on toxicity encountered in Kabadabad to unsettle the narratives developed in decades of environmental advocacy campaigns. I began by recounting an example when my *kabadiwalla* friend Shaheed openly denied the presence of pollution in Kabadabad. Sahih Kaam employees' position, echoing arguments about "slow violence" (Nixon 2011) was that *kabadiwallas* were ignorant of the effects. My aim has been to take Shaheed's denial of pollution as an indication of awareness and ask what was at stake in proving that e-waste work in Kabadabad released chemotoxic substances. Through an exploration of the relationship between chemotoxic substances and ritual pollution, I argued that chemotoxic substances when not managed properly have the potential to settle on the landscape and on the inhabitants' and workers' bodies and thus to produce negative value. However, e-waste and the toxicity released from it do not have the same effect as ritual pollution does, which allows the Maliks to take up the job and use it to improve their status. *Kabadiwallas* have found that the campaigns aimed at international corporations and the government proving the mismanagement of waste on the ground did in fact result in complex caste- and class-inflected urban inequalities. It is the threat of this devaluation that stops testimonies from emerging, makes Samir turn the question around to highlight my vulnerability, and question its definition by long term exposure.

In the face of this, Sahih Kaam's awareness sessions and the purpose of showing the film, staging a story within the story, shows how *kabadiwalla* bodies are enlisted, scaled up, and made transportable by erasing their reluctance. Through the "haptic visuality" (Marks 2000) of the film, they aim to produce an affect and create an embodied value (Ecks 2022), resulting in a retraining of the senses that make the imperceptible perceptible and actionable. For this, they rely on a host of already existing assumptions about urban infrastructural breakdown, and the presence of bodily effluents mixing with chemotoxic substances. Kabadabad, in the process, became a place elsewhere where concerns about the environment and e-waste's toxicity could be located, but also experienced. The contrasting claims to e-waste's toxicity point at the struggle over imposing meaning and values on bodies and the physical environment they are situated in. In this sense, the chapter builds on the previous chapter's discussion on how e-waste breaks apart through informal market exchange, to present another value transformation between the toxic effluents that are not controlled, and the devaluation of social identity.

Such a situation arises in the case of e-waste recyclers in Northeast Delhi, which highlights that toxic relations depend on the scales of power relations. While, often, studies explore local contexts where toxic effluents are caused and backed by industry and power, who marshall toxicity's indeterminacy to deny claims to the harm caused, yet in the case of informal e-waste recycling, the role of corporations remains obscured. This has become particularly significant since the E-waste

Rules of 2016 have been put into place, which seek to recruit electronics producer brands, bulk consumers, and recycling facilities to take responsibility when disposing of post-consumer electronic items. In the interest of enrolling industrial actors to do their jobs properly, then, informal e-waste workers stop being victims and become the causes of a problem. Images of Indian and Chinese workers in e-waste strewn squalor may have been disruptive in the early 2000s as the international alliance of advocacy groups launched a solid assault on the silence around the consequence of the growing piles of electronic wastes. At the same time, the embodied response to toxicity and its caste, class, and gendered implications points beyond the problematic of interested and complicit e-waste dealers. There is a strong sense that living and working in urban landscapes saturated with toxicants and harmful gases, and in a state of constant infrastructural breakdown, affects bodies in similar ways as ritual pollution does. Two decades on, such images and reports do not capture the kind of concerns and understanding of those who themselves are most exposed to the toxic substances. Rather, they become proof that urgent intervention is needed. The devaluation of informal e-waste labour (Corwin 2020) creates the ground for working out an official, responsible value chain.

Chapter 4 Threat of Vicious Circles and Material Arrangements of Honesty in E-waste Recycling in India

It was one of Manish's monthly visits to Sahih Kaam's company head office. On most days, Manish divided his time between the company's warehouse and doing the rounds at an informal e-waste market. Manish was the PROs representative managing the exchange with aggregators in Kabadabad market. Manish, on his monthly visits, was carrying the documentation pertaining to this exchange, which formed the crux of Sahih Kaam's efforts to redirect e-waste into formalised channels. Sahih Kaam presented this process of acquisition of e-waste, originating in Kabadabad and accompanied by a paper trail in audited and transparent recycling circuits, as the conversion of e-waste. And this service, provided to the producers, was the key to establishing circular economy.

Manish, along with the documents, also carried news of the Kabadabad market to the head office, which was necessary for the company's functioning. Rather than speaking about hazardous resource recovery practices and the toxicity of the e-waste market, Manish, on this visit, offered another shocking episode from the market. "Global Recycling Solutions (GRS)," another PRO and Sahih Kaam's most significant competitor, "loads the car with some stuff, they place LCD screens and TVs at the back for show, take a photo, make it go around the market and then come back to the same warehouse to unload."

An example of a malpractice, the car loop that did not leave for anywhere, indicated that the E-waste Rules and the policy tool of EPR was undermined by the very actors who were supposed to be closing material loops and developing circular economy. This was a new complaint in e-waste recycling after decades of unease about informal resource recovery practices that led to the perception of the e-waste market as a toxic place. The new law, while ostensibly about setting up the conditions for a functioning, profitable, and formally recognised e-waste recycling, was creating new opportunities to undermine its implementation. More than that, Manish was recounting a flawed material loop, one complete with documents proving legal compliance despite a resource recovery that had never materialised, which provided a counterpoint to Sahih Kaam's definition of what it meant to be honest and "to do the right kind of work"—that is instituting circular economy in the pursuit of environmental responsibility.

The frustration of Sahih Kaam was rooted in the lack of enforcement on the part of the government. Rather, to make it more exact, the government seemed to be interested in enforcing only some parts of the e-waste rules, parts which were ineffective but meant extra work for Sahih

Kaam employees. On one occasion during my fieldwork, the government stopped the electronics import of the PRO's most important clients, causing a loss of significant revenues, because audits found several e-bins and collection points were not well-maintained. The obligations of maintaining collection points were part of the producer responsibility defined by the e-waste rules, yet in fact, they contributed very little to e-waste collection. Thus, lax enforcement meant selective attention to the least effective and least crucial parts of the e-waste rules, which, nonetheless, meant many working hours for Sahih Kaam employees.

The present chapter explores the contradiction involved in the necessity of developing "compliance bureaucracy" (Babb 2020) to implement circular economy in e-waste to prove correspondence of material flows. The challenge of "closing material loops," the openly expressed priority of Sahih Kaam, lies in establishing transparent and auditable secondary resource recovery channels to bracket out e-waste's toxicity. Yet, closing material loops is possible in more than one way, not always with the optimum outcome for resource regeneration and environmental responsibility. I explore this challenge posed by unregulated material loops, an already pre-existing circularity, as opposed to the more usual definition of circular economy as contrasted to linear economy and the "take-make-waste model." I argue that competing logics of creating value in different overlapping value chains create and sustain the vicious circles that challenge the establishment of circular economy. Independently of the question, whether circular economy is fully implementable or not, here I am concerned with the ways in which the idea of the circle as a metaphor of production is reframing practices of resource making. In other words, I am asking the question: What are the local, material effects of the circular economy policy tool? And, in the absence of state enforcement and of a lack of economic rationale, how does Sahih Kaam maintain its high-standard and environmentalist commitment to circular economy—the virtuous circle instead of the many vicious cycles?

Transparency, audits, and honesty

The context of Manish's intervention was a moment of office crisis. The compliance team of Big Electronics (BE), a major global electronics producer and one of the founding clients of Sahih Kaam, had just announced their intention to visit the Delhi warehouse and the informal market on that day. Sahih Kaam's environmental ethics rested on opening themselves up to such visits, operating as de facto audits. The BE client team was considered the most demanding of all the clients and their intention to visit occasioned a frantic search for a person who could show them around. The issue was that the company had recently lost trusted colleagues who would have known how to handle the demanding clients, while the newly hired employees had not even been

to Kabadabad yet, let alone had experience of guiding clients around. They could not be trusted to hold their ground in the face of BE's insistent probing.

When Anjali, the head of communications, was informed about the makeup of the visiting team, she spun around on her heel looking over her team and, then, settling her eyes on me. "Then you'll have to handle them, the person who is coming is crazy, and they are also working with our competitor, GRS, they cannot be made a fool of." It was in the face of this anxiety and the threat of the competition that Manish recounted the flawed GRS loop. The observation reiterated the company common sense and ethics: that no one else in the market *did any work*.

I asked Anjali why BE would work with GRS if everyone knew that they were "not doing a good job," a phrase that came to stand in for the various ways in which laws and the goal of environmental responsibility were circumvented. She answered, "The BE producer team wants to be taken for a fool by them. They know that we do a good job, so they whip us to do better, which is good, but he can't handle it," indicating one of the newly recruited employees who had been lined up for the job.

Her response illuminated the double standards that operated in the market, one for GRS that did not claim to do anything else than provide compliance at a base rate and one for Sahih Kaam which promised to deliver more. On another occasion, Anjali explained to me what was lacking to do sound business:

> We need a level playing field if we want honesty. We are getting praise, but *abhi tak koi dandha nahin hai* [so far it hadn't become a business], government *ne kuch kiya nahin hai* [government has done nothing]. Producers are saying that they don't want the fancy things, they want low cost of operations, they don't want to pay for anything extra.

The remarkable aspect of this pronouncement was the mention of honesty as the condition of being able to do business and how that was linked to government inaction. Government inaction, as it turned out from further explanation, was defined by the lack of "digital enforcement mechanism" that would make scrap trackable and auditable. Further requirements were framed as having established standards in the sector through a "mass balance sheet" and "recovery targets for recyclers." In the absence of these legal requirements, recycling operations were not measurable and recycling plants and other PROs who did not subscribe to the ethic of honesty, could get away with not doing work and letting scrap leak back into the informal sector. Sahih Kaam introduced such measures in their own value chain, to shore up their reputation and establish their honesty. At the same time, they were hoping that, leading by example, they would trigger such processes that could become a blueprint for what the government would be able to adopt.

What concerns me here is the centring of honesty and the role ethics play in establishing fair competition. Actually, Anjali's comment summed up the two main challenges for the PRO. On the one hand, their operations were made possible by a government that instituted a market in environmentally "sound" services but, with that, the state appeared to think its work was over and did little to regulate the newly created market further. On the other hand, they were dependent on business from producers who supported the enterprise because they were somewhat prompted by the law and by consumer demands for environmental responsibility, but who were reluctant to pay for the PRO's costly services. They strove to make a difference for the environment, too, but that came at a higher price which producers were often not happy to pay for, as they did not understand the difference between the different quality services being offered. And this was precisely where the risk of the situation lay, not so much in being found out for "not doing a good job,"—GRS was doing so without any consequence—but in losing face because of promising more in terms of environmental standards even at the cost of affordability. This environmental ethics was defined in the absence of government enforced standards, which failed to stop "leaking to the informal sector" and related malpractices such as the one Manish had encountered. At the same time, recounting such stories, the government's ineffectiveness and the competitors' ways of avoiding honest work bolstered the work morale at the PRO. It was the prospect of failing to live up to this ethics, and not the governmental requirements, against which the company's practices could be found lacking.

As Manish's story shows, the documentation also bears dubious evidence to environmentally responsible recycling. The informal sector, its lack of concern for workers' safety, the open-air burning of plastics to recover metals, and the release of toxicants into the environment, used to be blamed for the failure of India's e-waste laws. However, Sahih Kaam's insecurity shows how, in a context of lax implementation and missing industry standards, it is not straightforward.to know what the informal sector activities may mean. This is particularly relevant, as there is also clear evidence of extensive reuse and repair practices, and as the informal sector also provides recycling services to produce secondary resources (Gidwani and Corwin 2017; Corwin 2018b), even if these lack transparency and auditability. Both GRS's malpractices and its undocumented reuse and resource recovery may be seen to share some characteristics of circularity, suggesting that the economy is already circular in many ways. Yet, as Sahih Kaam's distinction shows, circularity on its own does not mean doing the right work. For that, one needs honesty, too.

The many ways in which e-waste is already circular in India

E-waste legislation and the vicious cycle

The concern with monitoring, transparency and auditable channels in e-waste recycling goes back to the time when e-waste first emerged as an environmental concern in the early 2000s. The first influential reports by the international Basel Action Network and the Delhi-based Toxics Link, discussed in the introduction, focused on illegal transboundary shipments of e-waste from OECD to non-OECD countries (BAN 2002; Toxics Link 2003). Yet, the control of e-waste flows proved less practicable (Josh Lepawsky 2018; Josh Lepawsky and Billah 2011). There has also been a shift in global e-waste flows, no longer mapping over narratives of environmental injustice of the Global North against the Global South. In the meantime, consumption rates grew world over, making local e-waste production as much of a concern as export of e-waste from the OECD countries. Correspondingly, recently reports have framed the issue of e-waste as high rates of undocumented e-waste that is supposed to end up in the landfill or in informal operations (Baldé et al. 2017; V. Forti et al. 2020). Most recent official estimates in 2019 claimed that, out of 44.3 MT of global e-waste produced that year, 84 percent remained unaccounted for (V. Forti et al. 2020). Locally Toxics Link campaigned with the Indian government for the institution of a legal framework which would regulate who had the right and in what conditions to recycle e-waste. The lack of documentation has been understood both on local and global levels as evidence of illegal dumping and illegal informal sector activities.

In 2019, Toxics Links, after two decades of environmental advocacy and campaign, published a report examining the effects of the rules they helped to draft. In their first 2003 report, they had focussed on the economics of informal recycling in the e-waste markets of northeast Delhi and its environmental consequences. In 2019, they revisited the same places, only to find that, apart from minor changes, the industry looked much the same. The report recognises the important role played by the informal sector: being the backbone of the recycling industry, it is said to contribute to the circular economy and to keep "tonnes of toxic waste out of landfill [sic] and also provide livelihood to millions of people." Yet, so claims the report, its environmental impact cannot be debated (Toxics Link 2019). The report's main significance, given Toxics Link's involvement in drafting the law, lies in revealing its original intentions and the way in which the current state of affairs fails to live up to it. "Post E-waste (Management) Rules 2016, it was expected that e-waste flowing towards informal markets would reduce and the clean channel or the formal ecosystem will take over" (Toxics Link 2019, 23). However, this had not happened; "the informal sector is still the key player and receives WEEE from informal sources, as well as from formal sources-

industries, bulk and individual consumers" (Toxics Link 2019). Consequently, the informal sector's share has not diminished to the extent that advocates and lawmakers had hoped. Thus, the law did not seem to solve the problem, but it gave rise to new opportunities of circumvention.

The report also offers a curious turn of phrase, which illuminates the particular difficulty posed by multiple circles, instead of the one of circular economy. The flowchart reproduced below is introduced with the caption: "*The flowchart describes how electronic and electrical waste in India moves from the formal sector to the informal trading and processing units and the recovered materials and repaired/dismantled functional parts are sold to the formal market again. This* vicious cycle *thus continues to sustain, holding the hands of formal stakeholders in the country* [sic]" (Toxics Link 2019, 24, emphasis mine). This, perhaps little considered, remark spoke to what I found during my ethnographic investigation: that in fact Sahih Kaam's issues were not so much due to the linearity of the take-make-waste model, but rather to the fact that the economy was already circular in unacknowledged ways.

Figure 5: Informal E-waste Flowchart

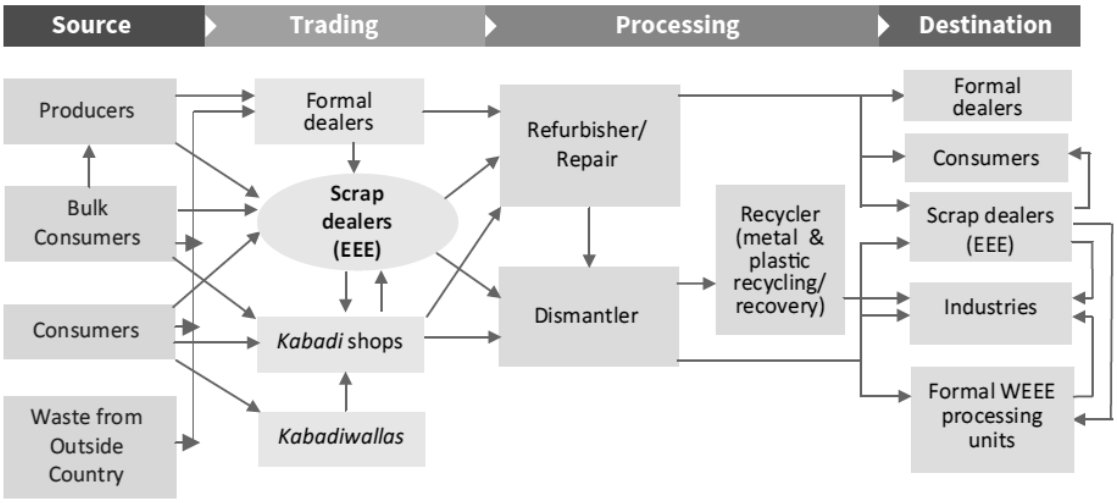

Figure 1 Flowchart from Informal E-waste report by Toxics Link (2019)

The flowchart starts with the easily definable and legally regulated actors listed under "source." The trouble is documented under the label "trading," where the first category of actors, instead of only selling to formal dealers (defined by government approval and registration), which is a requirement by law, also sell to "scrap dealers," "*kabadi* shops," and "*kabadiwallas*." Based on the caption, one would think that, as waste is transferred to various waste traders, it moves out of the formal sphere, out of the reach of government regulations. Yet, many actors who may be described by these labels in fact have been registered with the government authorities, making their categorisation as informal a hard one to establish. The Hindi vernacular terms "kabadi shops" and "kabadiwallas" imply the actors who are suspect from a systemic perspective of belonging to the

informal sector. Yet this informality is far from evident, since most of them, including actors under "processing," may even be registered with the Central Pollution Control Board (CPCB). Dealers are often registered but carry out activities that would usually be termed informal based on aesthetics judgements rooted in the advocacy and media representation of e-waste as an environmental problem (Pathak 2020b). More than anything, the flowchart demonstrates the impossibility of discerning formality from informality, making this conceptual duality of dubious utility. While the notion of formality implies certainty, among e-waste dealers and dismantlers there is a high degree of fluidity between the demonstration of registration and the mode of operation (Gandolfo 2013). Informality is also at the heart of state practices making its operations possible (Ananya Roy 2009). As Manish's allegations against GRS show, actors at the heart of formalisation, with international links and reputations, may come under scrutiny for their informal practices, undermining the raison d'être of the conceptual duality (Ojani 2022). Yet, despite such conceptual problems, the informal/formal divide continues to hold utility for Sahih Kaam and other actors in the e-waste ecosystem, not the least because of the types of material recovery practices that each of them implies.

Sahih Kaam's value chain

Sahih Kaam was started by Satkar Bansal, backed by three-four big international electronics producer brands that came together to set up processes and a value chain that would "channelise" e-waste away from the informal to the formal sector. When Sahih Kaam started its operations in 2017, in one way they were entering a new market, in another they were entering into a perhaps already saturated one. What they called an "e-waste ecosystem" was densely populated by scrap dealers, refurbishers, dismantlers, recycling units and local and international advocacy groups. It was Sartkar's reputation of an honest man in doing business, buttressed by important industry connections, which set apart the PRO from the first moment of operations—a fact often stressed in conversations. In addition, his employees also laid stress on their boss' expertise emphasising that he knew everything there was to know about the e-waste issue. This came with a particular charisma that clearly helped him in his dealings, getting contracts and partnerships, even though the for-profit and corporate nature of the operation may have incited suspicion in the eyes of the advocacy groups significant in the field.

Honesty and expertise were the qualities that allowed Sahih Kaam to straddle the two worldviews, the official one presented by Toxics Link and the experiential one of the scrap dealers and refurbishers. The former had come to be known for resource and the other one for hazard—formal and informal—making the PRO an interesting entity for ethnography, one in a precarious

position having to interest producers in going beyond a mere fulfilment of EPR, while at the same time, also attempting to manage the risks associated with toxicity and informality. The possibilities for their operations were provided by the space opened up in the wake of Toxics Link's and other actors' lobbying with government to intervene, necessitated by e-waste's toxicity (Corwin 2020), into the field of relations already established by the vigorous sale and resale of e-waste. Circular economy, its claims to being the science behind environmentally responsible e-waste handling, provided the linguistic and calculative framework to bring together honesty and expertise, and create the unique selling point of the PRO.

When I asked about circular economy, the employees of Sahih Kaam, many of them graduates of Europe-based environmental studies programmes, would point me to the Ellen MacArthur Foundation's definition. The Foundation's website in 2020 used to have a rolldown multimedia infosheet, replete with videos that explained the original sin of modern man and woman: "the take-make-waste model" of what they call the "linear economy."[17] In contrast to this uneconomic, and thus unethical, way of using resources, the circular economy intends to harness the endless possibilities for growth provided by an infinite regeneration of resources. The three principles are: "design out waste and pollution", "keep products and materials in use," and "regenerate natural systems" (Ellen MacArthur Foundation n.d.). The idea is that circular economy has the potential to "decouple resource use" and environmental harm from production and economic growth. Its proponents often claim that circular economy is "a regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing, and narrowing material and energy loops thanks to long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling" (Geissdoerfer cited by Corvellec et al. 2021, 1). Yet, critics highlight that the concept is riddled with imprecise definition, pushing a belief in a win-win situation, ignoring the second law of thermodynamics, and that it is of unclear implementability (Corvellec et al. 2021). As it also became evident from interactions with Sahih Kaam, the touted success of the EU in implementing EPR and circular economy ignores the questions about the transportability of the concept. In the EU, circular economy carries the particular assumption of keeping waste within boundaries to retain secondary resources for reducing import dependence (Kama 2015). At the same time, in anthropology, the enticing effects of using the figure of the complete circle had come under considerable critique (Garcier 2020; Graeber 2012; Alexander and O'Hare 2020). More recently, the anthropologists' attention has been turned to actually existing

[17] The roll-down info sheet has given way to a less visually convincing but more detailed description of what circular economy is and how to implement it on the Ellen MacArthur Foundation website.

circular economies, including those that grow out of everyday practice (O'Hare 2021; O'Hare and Rams forthcoming). What interests me here is the condition of establishing circular economy, the circulation of documents it requires, and the ambiguity that remains in spite of the expectations of such documentation.

While there is a wide interpretation of what circular economy might mean, it had a very concrete iteration for Sahih Kaam. The goal of "closing material loops" is earmarked and displayed in a prime place on the company website and in information leaflets. In promotion materials, awareness sessions and social media outreach, the PRO extolls the quantified benefits of the right kind of material loop closures through a series of "did you know" and "food for thought" posts. Examples include visuals that present the choice between "linear economy" and "circular economy" as one between two roads, asking which one the viewer will take. But there is also information offered on the amount of greenhouse gases that can be reduced, or savings in monetary terms that can be made as an effect of implementation.

In a public event during my fieldwork, the representative of the EU delegation to India argued that circular economy presented an opportunity to create hundreds of jobs and save energy. She read from the paper in front of her, "So we have estimated that waste prevention, eco design, and reuse could bring savings of 400 billion euros, which is a huge number; it is similar to dollars […] it is 8 percent of our turnover […] and at the same time we would be saving greenhouse emissions of 2 to 4 percent, so it is really a win-win situation" (Chintan India 2019). In this way, circular economy also functions as a calculative device through a similar act that creates the economic grounds for the replacement of virgin resources by secondary ones, a process which is far from a straightforward process (Gregson et al. 2015). While such comparisons have the capacity to impress, such commensurations are based on social processes often employed, among others, in pursuit of appearing scientific and pushing through unpopular decisions (Espeland and Stevens 1998). For Sahih Kaam, the language of commensuration afforded by circular economy provided a frame to "disrupt the status quo," as one of their first leaflets announced, through establishing channels that would make such reductions possible to prove—that would indeed make the circle virtuous.

In India EPR and circular economy are both related in finding ways to foot the bill for recycling responsibly, ostensibly so that environment and human health is not compromised. In the EU, often held up as an example of responsible recycling in India, citizens pay for the handling of wastes. In India, however, consumers are accustomed to receiving money for discards, including paper, glass, and plastics, when they are sold to itinerant scrap dealers. Under EPR and in the hope

of establishing circular economy, environmental PROs such as Sahih Kaam receive money in the form of a fee from producers for providing EPR services. The fee is then used to make up for the deficit between the high cost of e-waste on the market and the low-price recycling plants are willing to pay for it.

Sahih Kaam, as one of the first PROs to be registered with the CPCB, was supposed to be a crucial building block in establishing a "compliance bureaucracy" for circular economy non-state actors tasked with "interpret[ing], apply[ing] and oversee[ing] adherence to government rules" (Babb 2020).[18] While in the US there is a legal framework for "compliance bureaucracy," in India it is lax rules and their incomplete implementation which provide an opportunity for non-state actors such as Sahih Kaam. Consequently, the business model in which the company would buy up waste from kabadiwallas was worked out by doing. Kabadiwallas were recruited, kitted out with bank accounts and GST (Goods and Services Tax) registration, and thus became formalised "aggregators." In a promotional video a young aggregator explained that this meant that earlier his earnings used to be "black money", but now "white money" came straight to his bank account. The bank transactions then also served as proof of regularisation and the photographic evidence of loading and unloading (proof of execution or POE) served as proof of having indeed channelled e-waste away from the "informal sector." Yet, this, as we can see from Toxics Link's interpretation above, still amounted to the failure of the rules, since it accepted the role of the informal sector as aggregator out of necessity.[19] If the law's original intention was to prevent e-waste from flowing to the informal sector, Sahih Kaam's business model can perhaps be seen as a creative reinterpretation of the Rules, even if government bodies accepted it. Thus, Sahih Kaam understood the flow of waste to have been formalised when it started in the informal waste market and ended in regularised, vetted, and audited recycling units. Despite a lack of oversight into recycling unit operations, the fact that e-waste ended up there, instead of being taken apart in small workshops of the informal market, distinguished Sahih Kaam's operations from other formalised agents.

Besides buying up waste and channelling it to recycling units, and in line with further legal demands, Sahah Kaam also runs consumer awareness programmes that spread knowledge of the danger of inappropriate recycling. Awareness sessions are conducted in the hope of increased, direct collection rates from consumers and offices without ever reaching scrap dealers and repair

[18] Also similar to the workings of corporate social responsibility, which has an extensive anthropological literature (Dolan and Rajak 2016; Cross 2016).

[19] At the same time, Toxics Link also recognises the need to include the informal sector in the implementation of the rules and avoid criminalising such important actors and a large section of society.

and refurbishing circuits. Thus, these can be seen as a processual move towards fulfilling the Rules' initial intentions. However, awareness programmes mean piecemeal collection rates. Due to small quantities in individual households and the mixed electronics discards originating in bulk consumer offices, the loop cannot be closed, and leakage to the so called "informal sector" will continue unabated. Given the high cost of logistics, the informal sector is much more successful at producing the quantities of sorted e-waste, which can be converted into legally defined categories required for EPR compliance. At the same time, the competing logics of creating value in different overlapping value chains is what creates and sustains the vicious circles that challenge the establishment of circular economy.

Kagaz ka kaam – circulating documents

It is in this context that the comment was made by Manish about GRS's loading of the truck for photo ops and unloading in the same warehouse. That the practice was not a one-off incident was confirmed by Sahih Kaam's trusted aggregator. "Yes, we had been approached before to do *kaagaz ka kaam* [literally paper work usually used in English as 'paper trading']." And while the temptation was great, since selling on paper would have meant being able to sell material twice, the aggregators, now educated by Sahih Kaam, said that they recognised the dubious ethics of the deal and refused to cooperate.

The employees of Sahih Kaam particularly begrudged the legally compliant, but unethical practices of "not doing proper work," since competitors provided services at lower costs in the absence of labour or transportation costs. Also, since the unique selling point of Sahih Kaam was to stop such dubious dealing in the sector, all parts of work life in the company were peppered with double guessing other companies' integrity and telling such anecdotes. From audit trips, employees would return dejected, recounting how the tables with suction machines to dissemble CRT monitors looked entirely unused, untarnished by lead dust that was supposed to be the result of dismantling. Everything looked too clean for the plant to have done any work. No stakeholders—companies, government agencies and business entities—escaped the probing by the PRO's eyes, whose employees prided themselves on honesty.

On my first "field visit" to the company warehouse with one of the office-based employees, we found a man being grilled by warehouse-based employees Manish and Kartik. The pair oversaw the sourcing, unloading, quality checking, rebagging and loading of waste material from Sahih Kaam's central warehouse. Danish, the scrap dealer under scrutiny, had delivered a truckload from Noida in the same bags that Sahih Kaam had sold them in. This effectively proved that the Noida

based formal recycling unit, despite having been audited regularly, had resold wares without having destroyed the material. Danish protested at not having seen the wares himself and having made an innocent mistake, but he was blacklisted and Sahih Kaam would no longer buy from him. The severity of the sanction should be seen considering the serious threat posed to the fragile trust that Sahih Kaam cultivated with representatives of electronics producer teams based on the company's capacity to channel waste into formal, responsible facilities.

Such practices created a highly charged atmosphere of mistrust. Rumours abounded that the recycling plant which held the highest number of contracts based on the CPCB website's list of EPR compliant electronics producers was in cahoots with the CPCB chief. The chief and the recycling plant owner, the rumour went, happened to live across the street from each other in the same neighbourhood. In another anecdote, another well-known recycler secured contracts from producers by theatrically placing a knife on the negotiating table. Whatever the truth of these claims, evidence pointed to considerable dividends yielded by running recycling plants without doing any processing, as owners were seen changing their cars regularly, progressing up the ladder of car brand hierarchy.

Despite their bad reputation, recycling plants continue to be awarded contracts and gain business, because they are an essential part of the e-waste recycling value chain sanctioned by the government. Sahih Kaam's aim to fill a role in the "compliance bureaucracy" and build its infrastructure through the creation of documented, transparent, and accountable channels in a field of previously unregulated practices in e-waste recycling, was in fact undermined by other formalised actors. Leading to what was termed a lack of "level playing field" in the industry, companies would provide on-paper accounting and documentation for waste to prove it has been sold through official channels. Yet, having provided the documentary requirements, the recycling companies would then leak material to unofficial downstream vendors, who continued to practice substandard dismantling practices that had brought international attention to the unregulated e-waste dismantling scene in India in the first place. Worse still, that material may be circulating in a closed loop between recyclers and informal workers via Sahih Kaam, was more than just a possibility. Thus, the e-waste recycling economy was already circular, but all the wrong ways in terms of Sahih Kaam's ethical commitment. So much so that even they could not be sure whether their way of "doing it right" made a difference.

Material Arrangements of Honesty

Producer visits as audits

Operating in the swampy terrain of a well-established informal sector and the highly dubious paper trading going on in the formal sector, Sahih Kaam needs to live up to their name. Besides "doing things right" and "working honestly" by developing practices that prove the material correspondence between paperwork and e-waste flows, they also hope to effect a change on a sectoral level. Sahih Kaam implemented their own processes, most of which were not required by law but were hoped to be adopted by the government as industry standards. I term these "material arrangements of honesty," because they are not only meant to signal honesty, but also have material effects that may lead to establishing circular economy and a phasing out of widespread malpractices.

One of the simplest moves of Sahih Kaam was to open their value chain to outside visits. While the Gurugram-based office was where meetings were held, the programme point included a visit to the company's Delhi warehouse. Many, often high-profile, partners of the company took advantage of the invitation to survey their premises. From employees of development organisations to electronics producer teams, everyone wanted to see where the magic of regularisation happened. Visitors would be usually asked to come to the office in the morning from where an employee would sit in a cab, or in the car hired by the visitors for the occasion. The long car journey from Gurugram, a satellite town beyond the southwestern border of the metropolis, to Kabadabad, which lies towards the northwestern periphery of the city, across the Yamuna River, provided an occasion to explain the situation in the e-waste market in more detail. At the end of the journey, which could take up to two hours, most of which would be spent being stuck in traffic jam in one or another part of the town, visitors and guide would emerge from the air-conditioned vehicle in a dusty, unremarkable part-rural, part-industrial edge of the city. Such visits were high stakes as can be seen in the anxiety that erupted as BE announced their visit.

Given the difficulty of navigating addresses in Delhi's urban sprawl, drivers were instructed to follow the route to the banquet hall situated on the first floor of the squat building. The ground floor was divided into four large warehouse units, with Sahih Kaam renting two on the left-hand side with a large shutter towards the front courtyard and two towards the corridor running down the building. The back of the warehouse remained shuttered most of the time with less fast-moving stock, while the front housed a little office booth with a computer and electric fan fixed on the wall. The warehouse was manned by Manish and Kartik, who formed the field staff of the PRO

and the subcontracted logistics team. Manish worked on acquiring waste and maintaining documentation, while Kartik provided support and checked the quality of material sourced.

Over the year, I saw the ebb and flow of materials in the warehouse depending on the time of the financial year. But I saw it entirely empty only once. This was on the day when the PRO's most important producer client, an American conglomerate famous for its high standards of privacy and ethics, came for a visit. By the time I arrived, the producer team led by the founder Satkar Bansal had left and we were greeted by the day labourers, who changed their usual torn, soiled workers' shirts to high-visibility vests, helmets, and protective gloves for the occasion. The bare walls revealed labels indicating where each type of waste would go, there were new lines painted on the usually dusty but now scrubbed marble floor to indicate space left for safe movement when the warehouse would fill up. This situation offered a stark contrast to business-as-usual. The contract labour rarely wore any protective gear, for which Sahih Kaam employees gave reasons pertaining to workers' discomfort with the heat and the difficulty of grabbing bags in heavy gloves. In usual times waste piled high would leave very little space for movement. Thus, while quantities could prove honesty, for the highest-ranking clients a clean and well-ordered warehouse seemed to be more suitable, and so it was only lucky that the visit was scheduled at a time when all the piles had been sent off to recycling.

After visiting the warehouse, visitors were ferried across the rugged terrain of periurban Delhi to meet trusted scrap dealers to demonstrate long-standing relations and prove the origin of scrap. While the volumes of e-waste in the warehouse demonstrated for visitors the company's honesty, the meetings with scrap dealers in the market provided the opportunity to demonstrate the impact of regularisation.

After BE's visit, Amit, a veteran Sahih Kaam employee who ended up leading the producer team around, recounted the visiting team's reaction to Shaheed's business, who sold keyboards in bulk to Sahih Kaam. "The producer team was very smart," he wrote in a text message. They started questioning why Shaheed continued to break CD-ROM players manually, an illegal practice in India. This called into question Shaheed's position as a regularised scrap dealer and offered a possible point of probing for the shrewd producer team. Amit was equal to the task, he responded by saying that the producer team insisted on seeing an "informal dismantler," so he was showing them one. The most important question that all visitors asked the aggregators was about the impact of Sahih Kaam on their life. To which on this occasion Shaheed answered his usual: he used to dismantle everything, but now he gave some of his goods in whole. Realising the gap in reasoning about formalised recyclers. Amit insisted that the company's long-term goal was to make scrap

dealers like Shaheed sell only to them, but the market could not be changed overnight, and the complete shift would take years. The producer team, in Amit's words, "was very impressed *ki main sab kuch dikha raha hum* [that I am showing them everything]." Thus, the combination of showing visitors around the warehouse, demonstrating processes, but also showing illegitimate practices explained through the right context, involved some risk but eventually cemented Sahih Kaam's reputation of an honest PRO.

Documentation and Warehouse Automation

The process of acquiring e-waste looked something like this: whenever Sahih Kaam wanted something (a category in which targets needed to be filled, laptops, keyboards, CPUs, etc.), Manish would get on his scooter and do a round at the market to talk to the aggregators. The aggregators, then, could start making arrangements to source the required items. Over the months I came to understand that the smooth and professional business of Sahih Kaam in fact relied on familiar relations with aggregators cultivated on an everyday level and Manish's presence in the market was a key to it. He had previously worked as an accountant for a large international NGO and that experience helped him in producing and maintaining the paper trail that proved e-waste flows from the market to the warehouse. Sahih Kaam developed an app with an online surface to upload digital copies of all documentation. The loading and unloading of goods (*maal*) required an intense documentation, some of which was required by the state, and some by the producers. Documentation included billing from aggregators, *dharam kantha*, or weighing bridge slips, e-way bill, GST[20] (goods and services tax), Form 6, were all required for transporting e-waste. Particular problems were caused by grave differences between different weighing bridge standards. Pictures of the lorry being loaded at the aggregator's premises and the same lorry being unloaded at the warehouse had to be uploaded with photo scans of the paper trail.

A recurring complaint of Sahih Kaam's value chain arrangement was that items often came cannibalised. As a result of the way materials were handled, aggregated, and broken down in the Malik value chain, laptops and mobiles would always come without batteries, which was not a problem since batteries came under different regulations. But the real trouble was that the same devices were lacking other parts, too. Smart and feature phones often came without printed circuit boards, laptops without motherboards, or CPUs (central processing units that are the bodies of

[20] A recently introduced and much discussed tax that unifies taxation of goods and services in the separate states of India. Toxics Links representatives highlight the fact that even informal scrap traders need to show these bills while transporting scrap across state borders, an added reason to question the concept of informality.

PCs) as empty steel chasses. This significantly reduced the value of the waste aggregated. The parts removed were not only the most valuable parts of the items, but also the hazardous ones, and the company was left with steel and plastic, which was often refused by recycler plants for their low value. In fact, at some point it turned out that Sahih Kaam had required a reputation of selling low quality waste often termed as *kacchra* (rubbish). This, despite the fact that Kartik, the warehouse-based colleague of Manish, provided a thorough quality check at the time of purchase, painstakingly going through each bag as the daily hired labourers of the logistics team unloaded the newly acquired scrap. Once unloaded, the scrap was piled high in appointed corners of the large hall, printers on one side, giving way to bags of laptops, keyboards, CPUs, etc.

Low value waste and cannibalisation has to do with the friction between EPR compliance and patterns of value recovery in the Malik value chain described in the first chapter. While in the first chapter I argued that the Malik value chain is what makes it possible for Sahih Kaam to fulfil targets, at the same time the practice of selling parts separately undermined the process. To counteract this, Sahih Kaam's most successful and youngest aggregators, Mahmood and Parvez, made their fortunes from going against the grain of the secondary scrap market by employed young men to reassemble already separated items. Mahmood and his partner separately bought up hard disks, motherboards, and power supply units to make CPUs EPR compliant and attractive to the recycler. Yet this business model also showed that, if not flattened in the process of dismantling by the formalised recycler, metal chasses could be resold again without scruples to scrap dealers. Sometimes perhaps CPU chasses could end up with the same aggregators selling to Sahih Kaam to be rebuilt into EPR compliant e-waste again. On one occasion a CPU chassis turned up in Mahmood's warehouse with the name of the Calcutta based PRO Hulladek, and we used it to sit on while consuming our afternoon snack. This was seen as further evidence that other competitors were not doing a good job. To prevent this from happening, eventually the PRO started asking for pictures as proof of destruction of flattened CPU steel casings. This also gave a deep uncertainty to Sahih Kaam, for without being able to control recyclers, their already regularised material, having been sold to proper recycling channels, might be leaking back into the informal sector. Thus, unbeknownst to them, they themselves might be also be perpetuating another loop.

The incident with Danish detailed above highlighted this danger. The incident was played out on the same visit when I was accompanying Santosh, a young office-based employee from the operations and logistics team. His purpose for taking the arduous trip, a one-hour metro ride and a thirty-minute autorickshaw ride in the heat, and on uneven terrain, to the other side of the town, was "to automate the warehouse." In concrete terms, he was testing a barcode reading gun, the

project in the pilot stage at that time, which, if it proved operational, would be rolled out in all the 27 warehouses across the country. The idea was that stickers would be printed at the time of the material's arrival at the warehouse, as scrap was rebagged and checked for quality. We spent most of the day getting the computer to print barcodes, setting the system up to make it most intuitive for the process of unloading, and trying to stick the labels on the rough jute bags. Although the sticker did not stick and eventually a sewing machine had to be brought in to sew the label in, the operation was declared a success. During the process, employees complained that Satkar did not allow them to use shrink wrap instead of the used jute bags sourced from the market, for obvious worries about creating more waste instead of reducing it. Once scanned, the barcode would reveal details of each consignment the particular bag belonged to, including invoice numbers, seller's name and the type and weight of the items inside.

The barcoding system proved to be a polysemic improvement. The acute crisis with Danish unfolding in parallel coloured the explanations and I was presented with the argument that the barcoding would counteract leaking back from the recycling plant to the company. The idea was that, by highlighting the origin of the waste on the bags, it would make it harder for the recyclers to resell it. At the same time, the label would make it possible, for anyone who wanted, to identify where the waste had come from. They would show me how sometimes they stuck the barcode sticker on the inside of the CPU casing, hoping that that would disincentivise the resale of items. However, this did not seem to be a foolproof method, given the fact that once items would be rebagged, the same material could still be resold, though this would require slightly more efforts than if there were no labels sewn on the bags.

When Santosh and I talked about "automation" again once back in office, it turned out that there was a more important function fulfilled by barcoding. It formed part of what was called the "automatization" of the warehouse, linking "inward" with "outward." Barcodes attached to bags and CPU casings allowed for better tracing between acquisition from aggregators and sale to recyclers. It became easier to keep track of stock, their position within company processes, and making it visible to producers through the app. When the barcode was scanned, the information about the consignment's location was uploaded to the app, where producers could check the status of the goods assigned to them. This included logging the consignments sent off to recyclers which contributed to fulfilling their targets. Since recyclers do not link up to the system, they do not use the same barcodes, traceability ended with delivery to the recyclers. The hope was, however, as Santosh explained to me, that the CPCB could be pushed to adopt barcoding and through this the traceability of materials would become a legal requirement.

Proof of Destruction

As it has by now become evident, one of the most important nodes in the effort to close the loop and create the perfect circle in the eyes of Sahih Kaam management are the recycling units. Yet, these are often closed operations which do not allow access to outsiders and, given their reputation it is anyone's guess what goes on behind their closed factory doors. The PRO had been trying their best from the start to audit recycling plants, but even the ones they worked with would only let them in on pre-arranged visits. As mentioned above, the way such visits were conducted, and their prearranged nature, left Sahih Kaam employees dissatisfied and suspicious of the work recycling plants were doing.

Towards the end of my fieldwork, the efforts of the PRO to increase the accountability of the recycling plants they worked with seemed to be paying off. Vantage Point was a new recycler that Amit was "onboarding," with no experience in the e-waste sector, having made their fortunes in tyre recycling. Due to their lack of experience in the e-waste sector, they looked to Amit and the Sahih Kaam team for support in setting up their operations. Their website is a testimony to their investment in large scale technology: they have one of the largest shredders in the world, operate electric forklifts and a "fleet of hybrid" vehicles. The language of intensive technological investment promises the right kind of recycling for the thousands of tonnes of e-waste that passes through the unit. Yet, months into the enrolment process, Amit was telling me that Vantage Point was not operational, as they did not know how to source e-waste. In addition, once Sahih Kaam sent their first few consignments, it turned out that their labour was really slow in opening mice and other devices.

It is in this context that another feedback loop was spawned by the barcodes and PRO labels. Vantage Point sought out Sahih Kaam's aggregators directly, having found the names of their businesses on the barcode labels (before they had been taken off and hidden in the barcode, Sahih Kaam used to print the information in words) and tried to recruit them to buy up keyboards, dismantle them onsite and carry the factions away. I heard this from Shaheed himself as he returned from the trip, being dejected because the plant wanted to buy the stuff at the same rate as that for which he could sell them. Moreover, he said, having to dismantle onsite would mean having to stay away from Delhi for days on end, which would jeopardise the rest of his business. Sahih Kaam's higher management found the practice outrageous, for they found it was a variation on the story of leaking waste material into the informal sector. At the same time Amit, who was responsible for liaising with the recycling plant, found the breach excusable if keyboards would be dismantled on site and the factions sold onto registered scrap dealers. The model was in any case

one that would solve the dire lack of skilled labour plaguing regularised facilities. While nothing came out of this particular deal, at the time it appeared that such labour arrangements may indeed become common practice among recyclers who are being forced to provide documentation of destruction on their premises.

In terms of removing the recycling plant bottleneck, Sahih Kaam had two other significant interventions. They encouraged Mahmood and Parvez to set up a dismantling plant that provides 24/7 CCTV footage. The idea arose during one of Satkar's early visits to the market, as part of the intention of regularising *kabadiwallas* and introducing "behavioural change" after the sourcing channels have been set up. The fact that Mahmood and his partner took the suggestion to heart was a source of excitement in the office as it showed that the relationship with *kabadiwallas* was deepening. The next chapter will expand on Mahmood and his brother Mohsin's family enterprise and on the idea of relationships. What matters for this chapter is the fostering of a dismantling plant and how Sahih Kaam saw this improvement in the value chain.

Once the dismantling plant was operational, Amit took me on his audit trip to the new unit in IMT Manesar, the industrial area further out of Gurugram. The experience is radically different from most descriptions of recycling plants. The unit is small and empty with labels on the wall indicating the places where each dismantled faction goes.

Mohsin, the young man who operates the dismantling plant offered his thoughts on the ethics of the e-waste business:

> You know what happened? From among the laptops that came in recently, three-four labourers found a few laptops that still work, got adapters from the market, and started using them. The other workers who didn't get a share came and told me, "Either give us some laptops, or take those away from them, too, 'cause it is not fair." I took their laptops and made them break them in front of me. If you look at this from an environmental perspective, it is not good practice [he said at my prompting], but this is honest recycling, meaning honouring the terms of agreement. If the producers pay for the destruction of items, then I can't have workers keep phones and laptops even if they are in working condition.

This story highlights how EPR rules may lead to increased transparency and accountability which in turn may contribute to the establishment of circular economy, but it also shows that this does

not necessarily mean environmentally sound practice. While involving big business and making producers responsible for their products' obsolescence is a welcome change from putting the responsibility of recycling solely on consumers, it requires constant translation of policies to the language of gain for companies. Producers are keen to make sure that the terms of recycling include the destruction of even working order items, since that reduces the amount of old items that defy the laws of planned obsolescence making space for new items on the shelves (Giles 2021). Ensuring product destruction then is part of the terms of engagement with which the producers hand over the fulfilment of their legally mandated responsibility towards the afterlife of their products.

Wholesale scrapping of electronics without reference to their condition is not as widespread a practice as it is in Europe. Many recycling plants have related companies that refurbish electronics, which is not against the law (Corwin 2020). Not surprisingly, however, it is the PRO's agreements with the producer companies that require all equipment to be shredded, irrespective of whether it was in working condition, or not. In the words of the owner of the fully auditable recycling company, this is honest work, meaning that it honours the terms of contract, but not necessarily environmental-friendly work.

Thus, by material arrangements of honesty I mean the socio-technical relations and understandings of order, which ideally work in collusion to provide a proof of transparency, accountability and, by extension, honesty. Through such arrangements, Sahih Kaam goes beyond the legal requirements of fulfilling targets in large numbers and battles e-waste's socio-material tendency to leak. All this also reminds us that although the Rules are there to define and regulate the flow of e-waste, their enactment requires constant material engagements and arrangements, leading to an acute understanding of how the law falls short and how it would have to be redefined. It also reminds us that previously existing material and social relations, in the form of unruly and unpacifiable loops and circles, impinge on the good will and ethical motivations of the actors involved. Documentation was required not so much for the pacification of materials, as in the case of ship breaking (Gregson et al. 2013), but rather for the pacification of unruly loops and circles, some that had pre-existed Sahih Kaam's operations, and others that proliferated with the new law, without regenerating any material at all, just moving things around for the sake of moving things around. At the same time, material arrangements of honesty carry the potential for pushing authorities to implement change.

Such material arrangements can be understood as being similar to the work that goes into resource extraction, materiality and mobilisation (Richardson and Weszkalnys 2014; Onneweer 2014).

Resources come into being through "an entanglement of processes and practices of abstraction, homogenization, and standardization aimed at inscribing the boundaries between nature and culture" (Richardson and Weszkalnys 2014, 21). The difference is that secondary "resource materialities" require intense documentation to prove the recovery of secondary resources out of discards. As Gregson et al. (2013) write, one of the two main things that make objects made of secondary materials into commodities is by making 'recycled' a defining characteristic of the goods. How this works is demonstrated through the example of recycled paper products, which link to "the conduct of an ethical self, while positioning the product in a wider network of products whose materiality is expressive of a duty of wider (planetary) care" (Gregson et al. 2013, 8). "For markets in secondary materials to expand and deepen", they continue, "requires the widespread substitution of secondary materials for virgin materials in a range of material processes." (Gregson et al. 2013, 8). However, the substitution requires that the extraction of secondary materials is abstracted out of the unruliness of social relations that operate in the informal sector. Sahih Kaam's efforts can be seen as working out channels to homogenise and standardise the recycling process, which requires intense documentation.

The required documentation serves a double purpose. On the one hand, documents help pacify the messy sociality and materiality of unruly circles, thus bracketing the risks associated with secondary materials (low quality and toxicity). Given e-waste's complicated materiality, and the contrasting coexistence of the logic of hazard and the logic of resource (Kama 2015), extraction requires reframing these opposing values to conceive of the conditions under which the replacement of virgin materials with secondary resources becomes conceivable. On the other hand, documents also make sure that the value produced in Sahih Kaam's responsible value chains is certified as such, while at the same time making sure that this value is transferable (Kockelman 2016), especially given the company's work with international electronics producers. In this sense, honesty is a curious ethics animating Sahih Kaam's compliance bureaucracy, given that normally, bureaucracy and documentation is supposed to do away with the need for being virtuous. At the same time, material arrangements of honesty are required for reframing "value regimes" (Gille 2007) in a way that secondary resources become recoverable.

Kabadiwalla honesty

Besides the importance of extending traceability, transparency and auditing to recyclers, the quest for the regularised *kabadiwalla* did not come to an end once exchange relations have been

established. Sahih Kaam's honesty was seriously undermined by the low quality and the limited quantity of e-waste that was sourceable from the market.

During one informal gathering in a luxury hotel for dinner, to give a proper farewell to a beloved company employee, the topic of the discussion centred on the expansion of the office. Satkar told me that apart from replacing those who left and expanding the number of office-based employees, Sahih Kaam was also looking to hire someone, someone honest, from the informal sector. He asked me to keep an eye out if I found someone they could recruit. I was reminded of this by Shaheed, who brought up the issue himself. I was not planning to bring it up with anyone in Kabadabad, because I was worried that it might make scrap dealers suspicious of me and my close relationship with the company. My worries were probably unfounded, as most people in the market anyway considered me to be attached to the company and I could not shake off this association even till the end.

Then, one evening, just before I left Shaheed's warehouse the question of working directly for Sahih Kaam came up in conversation: "Ah, yes, when that guy, Satya or something … [Satkar, I interjected.], yes when he came, he asked me if there was anyone like me who would be willing to work for the company. I told him I'll do it for 50 thousand."

To this I responded in the affirmative, "They wouldn't find anyone better than you for this position. Do you think they'd pay you that much?"

"They would have benefit; I would charge them 50 thousand, but would save them 60 thousand a month," came Shaheed's reply.

"I think they are looking for more savings than 60 thousand, but would you consider buying for the company?" I framed my question around willingness, because it appeared that selling to Sahih Kaam was one thing but getting hired would be another. Shaheed understood the question as a matter of precarity, "I was actually just joking … they would take me, take my knowledge, and then kick me out half a year or a year later." That side of the argument was less plausible to me, "Well, they'd probably give you a contract all right, but you might contribute to closing down the market." Which elicited a categorical no from Shaheed but then pushed him to introspection, "I don't have any cunning in me [*Mujhme chalaki nahin hain*]. All the others who are now selling to Sahih Kaam used to sell to me. They've now all gotten ahead of me. My mistake perhaps was that I didn't get a partner."

Although, as it turned out, not all of Sahih Kaam's prominent aggregators started out by selling to him, Shaheed was indeed the first trader to sign up. Him and his brother, the youngest of six sons, started out in the shadow of their elder brothers who had their businesses established in their own right.

Shaheed was confirmed as the most honest *kabadiwalla* also by other Sahih Kaam aggregators as well as employees. However, this title as such and the way he talked about it in the above conversation needs to be considered in the light of what such a judgement meant on someone's character in the locality. More often than using the word *imandaari*, which is Urdu for honesty, people in and around "the market" refer to people being *tez*, literally sharp, or *seedhe*, literally straight, but meaning simple or artless. While being a *seedhe* person is generally accepted as a good trait, being *tez* is a gender-inflected quality, where, if a woman is called so, this reflects badly on her personality. At the same time, a *tez* man might be good in business and have a sharp mind to conduct his various affairs. When Shaheed talked of himself as not having cunning in him, he was giving himself a backhanded compliment, because he was a trustworthy person, but it also meant that he could not make as much money as the other aggregators selling to the company.

As it will be explored in more detail in the next chapter, honesty is not a usual way to characterise *kabadiwallas*. They are often said to be involved in *do number ka kaam* [number two work]. Corwin (2018a) explains the concept as having been used in the used electronics-market as an analogy for informal or illegal work, but mostly referring to informal solutions (see also Gandhi (2016) for discussion in terms of monetary transactions). In Kabadabad, Samir said "*do number ka kaam*" was just common folks seeing them earning well and assuming that they were not doing honest work.

Conclusion

Eventually, after I had already left the field, BE stopped working with Sahih Kaam for a while indicating both that the sense of crisis on that day in the office was real and that they did not find it justified to pay more for services that they could get for less. Although, more recently their name appeared on the list of sponsors in a recent online series of events, so they may have signed up to work with Sahih Kaam again. At the same time, GRS, the competitor cited for its malpractices, started buying up waste from aggregators, the same ones that Sahih Kaam had been working closely with. This shows that Sahih Kaam's material arrangements had exerted some pressure to introduce industry standards into the ecosystem. I heard from other sources, too, that the barcoding system was planned to be introduced in other recycling plants, though that had nothing directly to do with Sahih Kaam's material arrangements of honesty.

In this chapter, I have explored the processes through which circular economy and its implied potential for decoupling environmental effects from continued production is made ethical. I traced Sahih Kaam's earnest efforts to establish circular economy in e-waste recycling and the challenges they encountered. The contradictions encountered along the way offer another example of how the institution of markets does not provide a solution to the environmental crisis unleashed by overproduction of consumer goods. A legally instituted market mechanism does not necessarily lead to a healthy competition towards the provision of ever improving responsible environmental services. Competition without legal enforcement leads to the imperative to cut costs leads to documentary compliance without actual material regeneration and the proliferation of unruly loops. The trouble is found at a conceptual level. Instead of having to transition from a linear economy to a circular economy, the task ahead of Sahih Kaam is to struggle with the different loops and circular movements of waste material, some of which lead to contamination, while others are not accompanied by any material regeneration. Such material arrangements are becoming increasingly important to implementing environmental responsibility. In the meantime, the decoupling of production from resource extraction and wastes remains a hard-to-reach dream for Sahih Kaam.

Nonetheless, through Sahih Kaam's efforts I traced how the circular economy requires institutionalisation of compliance bureaucracy to be widely adopted in the industry. In the absence of such institutionalisation, it is the language of "honesty" that comes to the aid of practitioners to garner the trust of other actors in the industry. I argued that this institutionalisation is required not only to pacify unruly materials into secondary resources to substitute virgin ones, but also to manage the intensely social loops and circles created by multiple possibilities of waste revaluation. The case of Sahih Kaam not only points to the challenges of establishing environmentally responsible handling of waste, but also the even greater struggle of making material regeneration a profitable enterprise. For authorities to be successful in this endeavour, the circular economy ethic would have to be inscribed into social and material relations, which I call "material arrangements of honesty."

Sahih Kaam's material arrangements of honesty hold the promise of aligning the interests of wildly diverse stakeholders to radically change the way in which e-waste is recycled. The goal is the management of materials and their regeneration in a way that limits the escape of chemotoxic substances. For these when not handled properly, have the potential to escape and settle as toxicity, producing negative value as it settles in the urban landscape and its inhabitants' bodies. As I discuss elsewhere, toxic substances do not clearly overlap with substances of ritual pollution, yet in the

changing urban fabric are often interpreted as a wider force of devaluating identities inflected by caste and class inequalities. The PRO brings diverse socio-economic groups into cooperation, from corporate actors to unruly scrap dealers and recycling plant owners, to manage effects of chemotoxic effluents. And in this sense "material arrangements of honesty" bears an analogy with rituals aimed at the management of ritual pollution. However, as long as interests remain unruly, as competitors continue to offer cheaper services, and recycling plants are not reigned in, Sahih Kaam's capacity to close material loops remains curtailed.

This is why Sahih Kaam focuses on expanding their reach, opening their own recycling plant and encouraging *kabadiwallas* to regularise and open their own. These activities are necessary to reframe e-waste to bracket its potential for negative value and to transform e-waste's potential for negative value into an ethical and productive one. The PRO's concern with impact among the *kabadiwallas* and *kabadiwalla* interest in establishing formal, regularised recycling plants should be seen as each corporate personhood, the company and the family, strive towards extending their influence in time and space.

Chapter 5 Targets, Weddings, Cars: number as a relation and relation making numbers

Once I started spending an extended amount of time among scrap dealers in Kabadabad, my trips to Sahih Kaam's office became less frequent. Yet, on the occasions when I did return, I was greeted with great enthusiasm and as someone who could be potentially bearing important information. On one particular occasion, Satkar greeted me with the compliment, "You are more Indian than the Indians," seeing my dress that I would usually wear to Kabadabad. "Come, sit down and tell me about how those guys can be helped? Are we reaching the right players, the bigger ones? Are we having an impact in terms of social development along the human development goals?"

The exchange was illuminating on more than one account. The way the attitude shifted in my favour demonstrated to me the power of establishing relationships in the informal market, to acquire prized knowledge (more on knowledge in the next chapter). Through my relationships in the market, my value grew, an experience which alerted me to the importance of various relations and the value of the person. At the same time, the questions also highlighted the main concerns in the relationship between Sahih Kaam and its aggregators ("those guys"). Were the aggregators big enough, so that their relationship with the company would create a dent in the way deals were made in the market? And did formalisation have a positive effect on the *kabadiwallas* beyond earning money, did it lead to "behavioural change"?

Mr Kakkar, Satkar's newly hired mid-manager in the Operations team, summed up my response to these question in the following way: "So she is saying that they are a tight knit caste group, they keep relation, marry amongst each other, and they don't tread on each other's territories, they won't lure buyers from each other." The reformulation took me by surprise; I did not think about not treading on others' territories. But the next day, when I wrote down this exchange in my notebook, the expression "the morals of the trade" seemed to describe well the multiple layers of concern that were bundled up in these few lines. The sense of an importance of morality and ethics was heightened by the suggestions that they were interested in giving back to the community. At the same time, this also seemed to indicate an unease about whether doing it right by the producers (previous chapter) meant doing the right thing by the *kabadiwallas*.

This chapter attempts to address Sahih Kaam's question: what is the "impact" of their work in the e-waste ecosystem and specifically in the informal market? The question of impact takes the reasoning about value away from both economic value and materiality explored in the previous chapters, to the question of relationships, ethics, and social status. At the centre of this chapter are

the ethnographically traced relations that constitute and determine the capacity of the PRO and the scrap dealers to transform e-waste. While making money is at the centre of the activities of both PRO and scrap dealers, the conversation cited above indicated an unease about accumulation. Mr Kakkar's comment highlights the need to pay attention to the ethics that accrue from the way large-scale, long-term infrastructural projects are financed (Bear 2020). On a smaller scale, the ethical implications of making money are part of the question of value transformations. As Guyer's (2004) account of the petrol pump proprietor at times of volatile prices had shown, there is a fine balance to be struck in the pursuit of money to avoid the charge of profiteering. The threat of such negative values create the grounds for ethical action (Graeber 2001). In the oil crisis of 1990s Nigeria, the charge of profiteering would invoke the figure of witchcraft, while in the late 2010s in Delhi, the charge that Sahih Kaam had to avoid were exploitation of informal sector workers and green washing.

The focus on relations in this chapter continues the examination of the various non-economic values that are caught up in the value transformations of e-waste between the informal and the formal sector. The question of "impact," as Sahih Kaam employees phrased, shows that even if earning a profit appear to be the main organising force for the PRO, it is also complemented by an ethical pursuit of responsibility. At the same time, through ordinalisation practices of the *kabadiwallas,* I examine claims to profiteering coming from environmental advocacy groups. A concern that, in its exposition, can be traced back to the configuration of e-waste as a problem of the informal sector: the production of negative value, but also the danger of criminalising scrap dealers. Instead, Sahih Kaam sought to include and regularise them.

I approach the question of value, in this chapter, through the question of what it means to lead "a good life" (Laidlaw 2014), through attending to the relational dynamics of the PRO with actors in their "ecosystem." I show the continuity and the contrast in their relationships with their producer clients and their aggregators. I begin by attending to Sahih Kaam's presentation of who counts in their ecosystem, continuing the discussion on the material practices of formalisation began in the previous chapter. I trace the relational dynamics between Sahih Kaam and its various stakeholders within the ecosystem and explore how the company extends its "intersubjective space time" to increase its capacities to transform e-waste (Munn 1986). As part of this, through the work of Strathern (2018), I examine the number as a relation and the relational dynamics in the way the PRO constructs itself. It is as part of the e-waste ecosystem made up of business relations—electronics producer brands, international finance and development organisations, government, schools—that I turn in the second part to the relationship of economic exchange with their aggregators, the Maliks. The attention to ordinalisation and ethics points towards the limits of

relational thinking, as drawn up by Candea et al. (2015). The third part of the chapter explores the PROs impact and the Malik way of making money out of e-waste and how the profits of that economic exchange are converted into status and class mobility of the caste through making kinship relations. I bring together an attention to number-based relational dynamics, ordinalisation (Fourcade 2016; Guyer 2010), and a question of ethics (Laidlaw 2014; etc.), to make a wider point about the class and status and the relations between PRO and aggregators (Weber 1968; Wright 2015).

How does this unlikely cooperation come about and how does the question of impact come to play a role in an economic transaction between them? I begin by taking another look at the E-waste (Management) Rules of 2016 in light of the numbers they produce and the specific relational dynamics these numbers bring about.

Numbers as relations; relations making numbers

The 2016 rules were an improvement on the previous legislative framework by defining the producers' responsibility in terms of targets and introducing the legal requirement to register for all stakeholders: bulk consumers, recyclers, dismantlers, refurbishing shops, and PROs. This pushes the PROs for the establishment of different relations required to show capabilities for collections (and awareness). The focus of the current section on targets also has the benefit of pointing towards the relational dynamics between the stakeholders and of explaining what the PRO is.

Thus, relations between stakeholders are brought about by numbers, but numbers are the result of complex calculations which have social and political effects (Knox 2020). In the field of anthropology of numbers, the concern has been to show that numbers, despite their reputation to be impartial, are everything but that. Poovey documents how numbers and double entry bookkeeping made relations of exchange calculable in terms of profit. This was achieved by extracting numbers from their social relations, removing the social relations of exchange from the ledger book and making the concept of zero balance possible. Numbers have come to epitomise the modern fact, as a result of intellectual labour that succeeded in presenting numbers as disinterested, credible, objective, and abstracted from reality. From the very beginning, establishing numbers in this way also helped their earliest proponents mask their own profits (Poovey 1998). That is, the function of numbers' appearance as disinterested is to mask all the other things numbers do. Numbers often become tools of activism and, therefore, the way they are constituted have to be examined and challenged (Pine and Liboiron 2015). In the case of e-waste, the activist

numbers established the grounds on which legal numbers were defined. Environmental activism laid emphasis on demonstrating through numbers that a 'tsunami of e-waste' was threatening the world and on connecting quantities to negative assumptions about informal recycling. Because the e-waste problem was defined in volumes, this determined how the 2016 Rules framed formal recycling as percentages of sales to be collected and channelled to responsible recycling channels. Given the demands of the numbers enshrined in the legislation, the PROs activities were oriented towards these percentages.

However, percentages are not less problematic than other forms of numbers. In particular, Guyer writes of percentage, "It is one mathematical formulation whose mechanics anyone with a basic education can understand, and it carries the potential of conveying transparency in the public domain, persuasive ethical and philosophical allusions" (2014, 166). At the same time, the power of the percentage lies exactly in its potential for vagueness, for more often than not, the whole of the denominator, the totality of which the percentage indicates the part of, remains vague or absent. The percentages in the Indian EPR legislation are no less exempt from such vagueness, although it is hard to know whether this occurs by design or by effect of the sheer complexity of the problem of calculating responsibility in numbers and targets.

In any case, the first move of the legislation is to establish and define the relationship between producer and responsibility in terms of targets. In this sense, what makes the EPR-driven percentages vague is their reliance on the total of sales by a company within a 10-year period. Being the person who used to calculate the targets of each client for EPR, Varun was best placed to explain to me its ins and outs. However, before he set out to do so, he made sure to tell me that "the numbers are sketchy," despite having been set down in terms of percentages in the E-waste Rules. Ten years is the maximum obsolescence rate of any item, explained Varun, the young jack-of-all-trades employee of the company, whom I eventually hired to be my research assistant for a short while. The Guide to Implementation document issued alongside the Rules determined the obsolescence rates of each item covered by the rules, which were then grouped by a smaller number of ITW (Information Technology Waste) categories. The provision of such a guide made calculations possible, though no less vague.

The first problem arose from the fact that producers would only hand over their past 10 years of company sales data to Sahih Kaam after having signed an NDA (a non-disclosure agreement). This suggested to Varun that, since there was no public database, the CPCB (Central Pollution Control Board) could only glean the total quantity of e-waste to be collected and recycled each year from the producers' own declaration. Thus, data remained patchy. The second problem came with the

calculation of the weight of the total targets to be collected, since sales data came in number of items sold. In the first couple of years, the service offered by the PRO to prepare and submit the EPR registration was much appreciated by producers and bulk consumers, who had no experience of the calculations and authorisation process. Thus, Sahih Kaam drew in their first clients by offering the service of calculating targets to be collected for the next financial year as well as offering collections, for even producers had no idea how to calculate their own targets. The particular calculation would be based on "the average end of life" of each ITW (Information Technology Waste) provided in Schedule I of the implementation guidelines that had been issued alongside the Rules. At the same time, Sahih Kaam also worked out their own schema of average weight of items. "There is no standardised weight of items," Varun explained.

> If you want to cheat the system, you can use lower average weights for the applicable categories. The government does not check, they'll never know whether it is true. Megaphone could have lied. Plus, they are under no obligation to show sales data. There were brands who, when they were told their actual weight first, found the targets are too high, they said we made a mistake and the targets had to be revised.

Despite the promise of percentages for transparency, this brought in insecurities about the very act of calculations. Despite the vagueness, or because of it, this "allows futurity to have a hopeful directionality" (Guyer 2014, 170). In the case of the EPR, the hopeful directionality was aimed at, in a parallel to taxation, claiming through law a part of the electronics producers' revenues, to be redirected towards fulfilling their responsibility—setting up collection channels and spreading awareness about the hazards of e-waste. Despite Varun's misgivings, the targets were in fact successful in creating relations between producers, responsibility, and the PRO. However, when their relational aspects were established and the numbers moved on to become tools for accountability and were made to relate to existing material, to the parts and the whole of available and collectible e-waste, then, the numbers began to break down.

On one of the first days that I had spent in the office of Sahih Kaam, the issue of numbers came up in a conversation with Anjali, the person in mid-management who took it upon herself to show me around. She shared with me her concern that, although they knew that the numbers are suspect or even wrong, they still use them. The numbers she was referring to were those that came to operate as 'activist numbers' (Pine and Liboiron 2015). She meant numbers such as the ones referring to the total of e-waste generated in 2017 (44.7 Mt) (Baldé et al. 2017), or India's place as the fourth largest producer in the world. She was particularly keen to know how organisations such as ASSOCHAM (The Associated Chambers of Commerce and Industry of India) came up

with their figures, which were widely cited across the board in e-waste recycling. Varun too was questioning ASSOCHAM's prognosis that Maharashtra, and Mumbai as its main metropolitan area, was producing the highest rates of e-waste, which did not tally up with Sahih Kaam's encounter of material quantities in the regional markets. Their highest amount of e-waste collections came from the Delhi area in 2019, although there were significant collections from South India too. The uncertainty that surrounded numbers in the e-waste field made it a slightly difficult ethnographic detail to keep following, particularly that I had never been a numbers person. Thus, some of my bewilderments might be on that account.

However, even beyond that, there was a general sense shared by those in Sahih Kaam that numbers were misused and misleading, and not to be trusted. Setting down responsibility in terms of percentages in the law was an improvement on the previous situation because of its relation-making effects but did not fulfil the hopes pegged on them. The setting of targets in terms of numbers came to be a problem, as the denominator of which the percentages were calculated that is, the percentages calculated in relation to sales and profits of electronics producers, shifted and had to be commensurate with the material available in the market. Thus, the question, then, is to what end were numbers used? How does the changing relationality of numbers affect the kind of alliances that need to be forged for fulfilling targets?

Relations made to fulfil targets

Sahih Kaam, as we had seen in the previous chapter, continuously struggles to define its own virtuous character in opposition to substandard material practices in both the formal and informal sectors. Yet, the "material arrangements of honesty" in fulfilling targets required the setting up of relationships with various "stakeholders" in the ecosystem. Candea et al. (2015), as part of their argument for maintaining an ethnographical interest in detachment and in the way relations are limited or cut, trace the multiplication of historical contexts which led to the privileging of relationality. In short, they argue that the world wars, industrial disasters, critique of development endeavours, etc. led to the celebration of engagement. These factors not only affected the direction of academic knowledge production on entanglement, but can also be linked to "the rising language of 'accountability' […] demand[ing] a more 'engaged' approach from organisations, businesses and government, an approach which ideally could meet the needs of 'clients', 'customers', 'citizens' and 'consumers'" (Candea et al. 2015, 11). In a broad sweep, Sahih Kaam as a social business is as much, if not even more, hard pressed to mobilise and engage a wider range of demographic—namely, government officials, electronics producers, citizens of all kinds, e-waste dealers, waste pickers—in the company's pursuit of disturbing the status quo in e-waste recycling. Through its

relations, Sahih Kaam strives to extend what Munn calls "intersubjective spacetime," (1986), a space created by the actions of an individual or a legal person in the case of the PRO. At the same time, Sahih Kaam is also interested in extending the potency of each actor in effecting value conversions. In the e-waste ecosystem, Sahih Kaam understood this to be achievable through doing business, earning profits, taking part in the market, in a marked shift from earlier ideas of environmental advocacy. Yet, they also took on some of the earlier ideas under the term of impact.

To understand what they mean by "impact," I need to go back to the beginning of my fieldwork when I was freshly arrived at the office. Upon hearing about who I was and what I wanted to do, I was immediately channelled towards the "awareness," a section of the company that ran workshops with schools, bulk consumers, and RWAs (residents welfare associations)—that is the citizens engagement section. They wanted to know whether their programme (the relatively standardised material they collated and used to present at different forums) was effective at all. At the same time, they also hoped that my research could be channelled into making awareness sessions more effective, in terms of helping to increase collections. Although at first I went along with this demand, but since the content changed little and I was interested in counting targets and the materiality and exchange of waste, I soon became more engaged with those sections of the company which were busy acquiring, warehousing and moving e-waste. The company's understanding of what an anthropologist does and the questions that can be asked to them did not just reveal a fundamental lack of certainty about the effect of their work, but also indicated a striving to do better, for something beyond making profits, establishing themselves as a PRO, or conducting 'purely' economic exchange with the Maliks. However, to understand this, I will now examine the PRO's self-image as it emerges through deliberations about its relations with producer clients. In fact, contracts with producers set the actual targets that the PRO has to collect from the aggregators.

The PRO and its producers

The most effective explanation of how Sahih Kaam conceives of itself came from Bhaveeka at a meeting with a group of foreign students from Sweden. The students had just arrived to take part in a two-week project with the company. As part of their university assignments that would count towards a degree in environmental management and policy, they visited the PRO to learn of their difficulties and, based on their observations, at the end of their stay, present a strategy to overcome these difficulties. They were accompanied by their professor, Thomas Lindquist, who had been the mentor of Satkar, Sahih Kaam's founder, and was affectionately introduced by him at every turn as "the father of EPR". In the weeks leading up to the illustrious visit, I was increasingly

drawn into the planning activities. As such, I was even described as a "Sahih Kaam resource." And when the group eventually landed, I was told to take part in the meeting to help answer any questions the students may have over and above what they had already sent by email.

One of the first questions that the students had addressed us was answered by Bhaveeka who was appointed by the managers to represent the company for the purpose of the meeting about marketing strategy. Thus, Bhaveeka began by saying,

> We should establish ourselves as a clean, transparent, legitimate PRO, the most optimum one, maybe a bit costlier one but operating according to clear benchmarks. This is a conversation we have when we are talking to a producer. We do not associate with brands that have a negative image. Ethical Corp is already established; Brambl is up and coming.

On most occasions, employees of Sahih Kaam started the conversation by talking about the company's unique position as the most legitimate PRO, because of its clean, responsible practices. However, this time—perhaps because of the promise of the collaboration with Thomas Lindqvist and his students—I was phrased more as an object of striving than as an accomplished state.

Then, Bhaveeka continued to draw up the main dilemma which she referred to as the "volume producer" versus "value producer" dilemma. Sahih Kaam was interested in value producers rather than those that brought large volumes. Value producers, Sunanda explained, were those perhaps with less volumes to collect in targets (or willing to pledge to Sahih Kaam) but known around the world for a sustainable image. Ethical Corp, for example, was a desirable client, she explained, since they had an operational takeback system and planned to start using recycled materials in their production by 2020. Producers such as Purr, BE or Brambl would also be desirable partners, since they were interested in more than simply compliance with the Rules; they were willing to be part of Sahih Kaam's wider goal of "cleaning up the value chain".

Such a business strategy might have been counterintuitive, as one of the students pointed out, since such stringent selection would reduce the number of producers and the volumes that the PRO would handle and, therefore, reduce revenue. But Bhaveeka responded,

> It's not that we don't want to work with them, but Security Breach (SB) shows up in a bad light, which we are weary of. However, we always want to be associated with the value producers, even if they don't give us much tonnage. Megaphone has huge tonnage, but what put us off was that they wanted to get the cheapest prices. What could have been done in 40–45 rupees a kilo they would have wanted it at 4–5 rupees.

She finished the thought by pointing out how beneficial it was to associate with the international development organisation with whom they had just finished a one-year collaboration. The association with particular producers and organisations and the distancing of others based on the willingness of each actor to participate in the larger plan of Sahih Kaam defined the company's identity. Associating with SB, given recent controversies around the company's security breaches (around that time in the spring of 2019), would not contribute to the good image of the PRO. Moreover, tying up with Megaphone, although financially desirable, would make it impossible for the company to establish itself as the cleanest, most legitimate PRO that is trying to clean up the system (as we had seen in the previous chapter).

Sahih Kaam even made a distinction between their various clients based on the kind of agreements. As one of the students was surprised to see, some producers' logos were printed in much larger size than those of others on the website (the website has been recently overhauled and this is no longer the case). Bhaveeka responded, "All our marketing collaterals carry the producer's logos. We have a tier system, in which category 1 refers to global producers with 75,000 tonnes, category 2 refers to international producers with between 20,000–75,000 tonnes." For each category, Sahih Kaam has set a certain number of awareness programmes, school programmes and a particular proposal for e-waste collection infrastructure. Yet, there are ways to gain in status as, for example, Brambl would have been a category 3 producer but through a little extra money they were upgraded to category 2. This is because, although internationally Brambl is the second largest manufacturer after Megaphone, they had only entered the Indian market more recently, which makes their rates of collectible targets low. Brambl may have been paying the PRO for the upgrade, but they were also the most active producer to deal with. Their environmental compliance team was most enthusiastic and constantly looking for ways to go beyond and above what they were required to do, sometimes even exasperating Bhaveeka and her colleagues.

Megaphone, though Sahih Kaam did not work with them, was often on the lips of Sahih Kaam employees, and particularly of Varun, who was very conscientious about his climate politics. Megaphone was the epitome of the problem with brands in terms of PRO employees' opinions, not interested in having an impact, not even for marketing purposes; only willing to operate at low costs, many orders lower than could be arranged in terms of Sahih Kaam's strict material ethics; having such large volumes, that were impossible to fulfil in terms of targets through Sahih Kaam's channels of acquisition. Varun would sometimes say, "Megaphone, with their large collection targets, would sink Sahih Kaam." This meant that if those collection targets were not met, the brand would have to face government sanctions, defined in import bans, a situation that was the responsibility of the PRO to avoid. Such a fate could have only been avoided through adopting

practices of paper trading, which would have ruined the fragile reputation of the nascent Sahih Kaam. This illustrates how, even beyond the issue of associating with value brands for the purpose of striving to the image of the clean transparent PRO, the numbers representing targets held the potential for undermining the material practices that defined their operations. This, the fact notwithstanding that tying up with volume brands like Megaphone, if it could have been done, would have held a promise of profits. In this way, money, just like number in the previous section, instead of its promise to limit relationality and make possible hard calculability, in fact produced the need to establish relations for the PRO.

The PRO's ranking and relation to its producers cannot be explained purely by the profit motive. This becomes evident in the way the PRO ordinalises its relations with producers and calculates the impact of its activities on their aggregators. By "ordinalisation" Fourcade (2016) refers to the way in which, despite efforts of liberal democracy to disentangle nominal from ordinal judgments of worth, the effects become differentiated. Fourcade argues that classificatory judgements—nominal, cardinal, ordinal—are part of the way in which people make sense of their world. However, she emphasises that these judgements are worked out collectively. Strathern's (1989) argument about conceiving Melanesian persons dividually emphasises the point that the numbering and ordering that is usually attributed to society is worked out relationally. This is precisely the point that I adopt in my discussion of the PRO and its deliberation about desirable relations. At the same time, I also take Fourcade's lead to examine the way in which categories work together to produce distinct hierarchies and allow for the transformation of value.

The ranking of the producers reveals a logic that goes beyond economic gain and indicates a striving for status based on the ethics of responsibility. In a rather short essay for the magnitude of "the phenomena of ordinality," Guyer (2010) indicates that the use of ordinals may be counteracting the achievement of numerical calculations. She sees ordinality as "a counterintuitive process under progressivist views of increasing sophistication in number use in the West, namely the rampant 'reduction' of complex calculations based on counting-number to ordinal number" (124). Guyer argues that the result of ordinal scales is a parabolic scalar form, where at the top of the scale intervals between each participant are significant, which then "diminish radically going down the scale, both in real terms and in proportion of their positions" (125). The association is with feudal values of flaunting wealth and luxury to prove top positions in the hierarchy. What is important is that the participants in ordinal ranking are continuously kept in relation through the competition, leading to "schismogenesis," using the words of Bateson, a multiplication of actors, buyers and sellers, to expand the market and multiply profits. Guyer is most taken by the recourse to a language of medieval knights and ancient worlds through such expressions as "the rules of

the game" and "the level playing field," where prime positions were fought over in the arena through "tournaments of value" (Guyer citing Appadurai 2010). This leads to a situation where numbers quickly slide from being measures, to meaning order, and to becoming fiction. Incidentally Sahih Kaam also partakes in such language even beyond the ordinalisation of its partners. As the previous chapter detailed, a constant source of tension for employees and management is the fact that they must operate in an ecosystem which does not create "a level playing field", where substandard service providers are not penalised by the government. Employees also insisted on representing the PRO as the first one to have been approved by the CPCB, an act which also seemed to veer into the recounting of a mythical past, though perhaps of limited marketing value.

As numbers and monetary exchange do not sequester other non-economic values that are circulating through these relations, other strategies for fashioning the corporate identity of the PRO come to the fore. As in the case of Megaphone the implication of the numbers involved would be such that they preclude the possibility of becoming business partners, the brand is kept as a non-relation marking the ethical stance that the company keeps.

Relations of impact

The nature of the PRO, and the particular organisational interpretation of this nature, that is, the company Sahih Kaam itself, places Sahih Kaam at a crucial crossroads, having to navigate between different sections of Indian society and economy. The previous chapter explored this relationship as one of translation, where putting environmental responsibility into practice meant expressing it through the use of the word "honesty." In the present chapter, I have been exploring the role of making and maintaining certain kinds of relations to produce and maintain values. For Munn's (1992) interlocutors the emphasis was on feeding visitors from foreign lands to take the fame of the feeder far and wide to improve their standing in the kula exchange. In corporate Delhi, trying to find a solution to a social problem like e-waste, establishing a wide range of relations with stakeholders creates credibility as a company. This is all the more so because, despite the preference for market-based solutions to social problems, Sahih Kaam was conscious of the fact that being a for profit company exposed them to the accusation of profiteering, especially in the eyes of environmental advocacy groups, such as Toxics Link and others. This is also why they were keen to work with researchers and local and international actors to cement their image as working for the public good even if within the sphere of the market (Bear and Mathur 2015). I should include here the appearance of "the father of EPR" at events, the odd foreign researcher, or of a group of master students, even of the anthropologist, who were also relationships that

aided the PROs self-image as engaged in an ethical project of responsible recycling. As some of the criticisms by NGOs and researchers relates to the exclusion and criminalisation of informal waste work (Gidwani 2015; Gidwani and Corwin 2017), Sahih Kaam also laid stress on demonstrating their extensive relations with waste workers and scrap dealers to make their business model ethical.

In a recent exchange with Sahih Kaam well after the end of my stay in Delhi, I learned what was meant by impact and, by extension, how they thought about relations. Anjali and Manisha reached out to me if I could help them by sharing my work, for they were putting together an application to the foundation of a big global corporation and they wanted to see if I had anything that they could use to prove their impact in the informal sector. I am not sure whether they found anything valuable at all in the draft of what forms chapter 4 in this thesis, because, as Manisha explained, what they were interested in is going beyond their use of numbers engaged, to show the quality of engagement. When I suggested that the story of how a family of e-waste dealers were inspired to become the first transparent and accountable dismantling plant owners, the suggestion was not taken. Rather, as Manisha explained, they would have been interested in providing further refinement of statistics by highlighting how many times each waste aggregator was engaged. The improvement would come by elaborating beyond the number of waste pickers engaged in the business (see figure 1 below for example), numbers of the frequency of buying, which would have given meaning to their numbers. This points towards another aspect of the relationship-making numbers and the attempt to ordinalise relations. While so far they had been ordinalising their relations through cardinal numbers, that is, by the sheer quantity of relations that they had established with scrap dealers, they now wanted to give weight to these numbers.

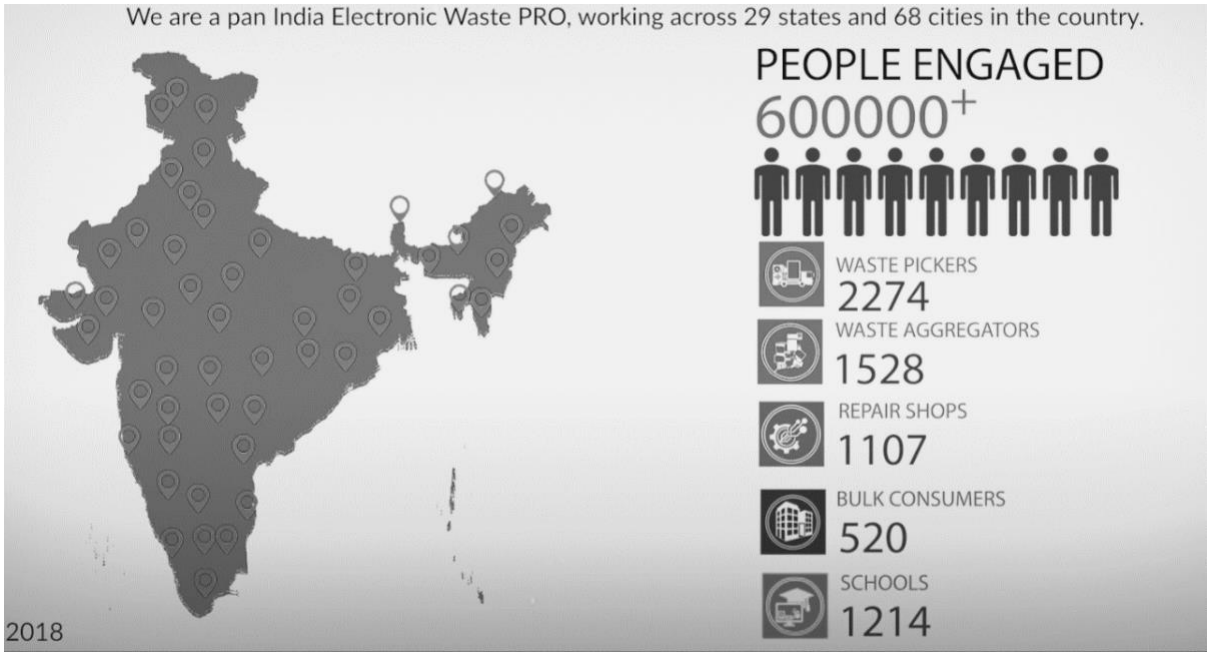

Figure 2 Sahih Kaam's statistics of its networks

Figure 2 shows an early stage of business development, when Sahih Kaam's main goal was to demonstrate their all-India presence, through the location marks against the map of India, and that they had been engaging a wide variety of actors. The numbers in this screenshot come from one of the very earliest marketing materials. The number of people engaged had multiplied by the time of my fieldwork. The screenshot also demonstrates the host of other relationships that the PRO had to establish to keep it from being sunk by the targets that they had been assigned through enlisting producers, as well as its aspirations to be seen as a company that is going beyond the profit motive to produce environmental responsibility.

Besides the display of ordinalised brand relations described in the previous section, the PRO's website and other "marketing collaterals" bore witness to relationships with other kinds of actors—the sum total of which they termed "the ecosystem." Marketing collaterals were objects that Sahih Kaam used to market its activities. This included handouts, brochures and the most important of them all, the "standee", a piece of plastic sheet with the name of the company and the logos printed on it. Standees were displayed at events, most of which were awareness sessions for "bulk consumers" and "schools," and had to be visible on the pictures taken for PoE (proof of evidence). Among the logos one would find some other actors, logos of government schemes and health organisations, set apart from those of brands. Once, when attending an awareness workshop, I was tasked by delivering an updated standee, because new producer clients' logos have been added to the list. For the awareness workshop to count towards the new client targets, it was essential that the standee with the right list of logos would be displayed. Yet, other relations,

such as the ones with the *kabadiwallas* or, as they are called in figure 1, "waste aggregators," were subsumed under and represented by cardinal numbers and visual material that formed part of presentations.

The politics of logos does not concern me in detail here. However, to illustrate it briefly, I recount the first meeting I had with the founder, Satkar. He told me how important it was to work with the government, both for consulting on issues of implementation, and for the government's role in accounting awareness programmes on their website. The government was aiming to "inventorise waste" through the filing of EPR plans and the reports written by PROs, as Varun explained to me on another occasion. However important it was for Sahih Kaam to work with the government, they also had to negotiate the brands' dislike for the government. Pranshu, in that first meeting, characterised the brands' objections as being about payments; the brands objected that, if the government did not offer monetary contribution, why should the government's logo be on the marketing collaterals? And yet, the government wanted to be part of the ecosystem, maintaining a WhatsApp group for sharing pictures of all events as a measure of accounting, and displaying such pictures on their own dedicated website. Similarly, to the government, international organisations and NGOs were also crucial collaborators, whose logos in publicity campaigns and verbal endorsement in the marketing video would contribute to establishing the credibility of Sahih Kaam.

In my fieldwork, as in the thesis, I was most concerned with the relationship between Sahih Kaam and the e-waste dealers. Beyond the statistics, the commitment to "including the informal sector" as opposed to excluding or criminalising them, was told and retold on numerous platforms, presentations, radio programmes, events, etc. A video demonstrating the impact of Sahih Kaam was displayed at a prime place on the website, which is full of moving images of gloved hands loading and unloading electronics at various states of disrepair as well as of interviews with the company's uniformed operations and logistics team and with "aggregators" in identifiably Muslim attire.

In terms of the ordinal scale of Sahih Kaam's ecosystem, aggregators were in some sense placed on a different scale from those organisations whose presence could be indexed with logos. If imagining Sahih Kaam's relations in terms of Guyer's (2010) parabolic scale, at the very top are the singularly important producer clients, whereas the aggregators would appear toward the bottom, less identifiable. While the aggregators' positions were not comparable to those of the brands that sponsored the work, they were valued by the fact of their selling to Sahih Kaam. Thus, a relation with scrap dealers was of high importance. Ideas about social stratification and

discrimination in South Asia might suggest that aggregators would be occupying the lowest ranks along the bottom. In fact, as can be seen in Figure 1., they are ranked after waste pickers (by the time I joined waste pickers and repair shops were not actually part of Sahih Kaam's work anymore, but relations with them were still cited a major achievement to promote). The spatial arrangement of the figures on the screenshot may be happenstance to a degree, for example, given the success of the school programme, the number of schools engaged became an important figure to highlight in later years. However, the prime position of waste aggregators among the relations that would be represented through cardinal numbers as well as the map illustrates their important place in the ecosystem.

As already explored in the previous chapter, the existence of material flows that tally up with the quantities determined in the targets and proven by the paper trail were central to the PRO. This was implementable because of the relations cultivated with aggregators. In the next section, I examine the role of ordinalisation and numbers in patterning the relationship between the PRO and the e-waste traders. Then, this discussion leads to the Maliks' own practices of ordinalisation in patterning the making of marriage relations. Marriage practices are not quite considered to be of the same order of things as business relations, but I found it productive to juxtapose these two unlike ways of making relations in the two parts of my field. The contrast as well as the narrative read in continuity are quite revealing of the projects of self-making that these two groups of people are engaged in as their collaboration is crucial to fulfilling targets in pursuit of environmentally sound e-waste recycling.

Making money to make relations; being a person in the Malik way

For the anthropologist that I am, there is nothing that tells as much about the impact of Sahih Kaam as the story of Mahmood's family and the story of how they came to start a recycling plant. In fact, I found it remarkable that Satkar and Mr Kakkar thought that their aggregators should be helped at all. In Kabadabad, both the Maliks and the other castes thought that the *kabadiwallas* were doing well from their trade. Yet, non-Maliks often added that still it was "*do* number *ka kaam* [second order work]." When the topic came up with Samir, he told me that the people saw the Maliks doing well in business and then they assume the gains are illegitimate, which answer indicates that the caste has not been doing well in managing the negative value that can accrue when making money. In contrast to Samir's family, all of whom remained very much embroiled in the ways of the market, we can see a clear effort on the part of Mahmood's family to escape such negative notions associated with the trade.

The father, a small built man with a beard, who wore a white kurta pyjama and a hat and lay around the house most of the time, had started as a hawker selling oil on the Police Lines in Meerut, the planned residential area for police personnel and their families. He brought his family to Delhi in pursuit of a better livelihood, first settling in a slum on the floodplain of the Yamuna, then moving into Kabadabad, moving in with relatives at first. The father started doing *kabade ka kaam* (scrap work) by going to Punjab and bringing back all forms of scrap, consumer electronics, etc. Eventually he set up a shop somewhere in Shahadra. When they were teenagers, Mohsin and Mahir, the two eldest sons, opened a mobile phone shop and enrolled at the University of Delhi to study law. One of them did full-time, the other did evening courses, and they alternated in running the shop. Mahmood, the youngest in the family and a sixth-grade dropout, would help out in the shop but soon started to trade in scrap. He was dealing in printers when he encountered Sahih Kaam and immediately recognised the opportunity of becoming a Sahih Kaam aggregator.

Together with Parvez, his best friend and partner, they made the change from dealing in printers to assembling CPUs for compliance. Mahmood and Parvez made a complete transition to formalised businesses as they no longer broke electronic items in their warehouse, gave bills when selling to Sahih Kaam and received payments in a bank account. Mahmood and Parvez followed their, by now, hereditary job of buying and selling scrap, but they did so in the service of environmentally responsible e-waste recycling. They hired labour, boys even younger than themselves, to assemble CPU units for compliance in a rented old village-style, ground-floor, house with an open courtyard to serve as their warehouse. Since CPUs provide the bulk of producers' targets in weight, the two of them became the poster children of Sahih Kaam's project of regularising informal workers as well as their largest Delhi aggregators, making them an important ally.

The front room of the warehouse served as the boys' office where they sat around scrolling through their mobiles or receiving visitors. The guests would invariably be fed local delicacies, usually *paneer pakoda*[21] in expectation for vegetarian guests, and made to drink copious amounts of Coke. It was on one such occasion, as already mentioned in the previous chapter, that Satkar and the foreign lady he was showing around suggested that they open a recycling plant. Mahmood and Parvez took this advice to heart, but when Parvez pulled out of the partnership, the planning and organising fell on Mohsin. Although in Sahih Kaam the word was that Mahmood is starting a

[21] Cottage cheese cubes deep fried in spiced chickpea flour batter to be dipped in green coriander sauce or sweet and sour tamarind sauce.

dismantling plant, when Varun and I started visiting Kabadabad regularly, Mahmood directed us to Mohsin.

I met Mohsin when accompanying Amit on his audit of the new dismantling unit. He was a smart young man in the white shirt and black trousers of a lawyer, keeping hungry all day on the Ramadan fast in the heat of summer. He drove us in a rickety old Hyundai i20 from the Sahih Kaam office to IMT Manesar, the industrial park at the edge of Delhi's satellite town Gurugram, to inspect his newly opened dismantling unit. The first thing Mohsin told me about, was that he had been interested in environmental cases, and had done researched on the famous environmental lawyer M.C. Mehta. Given his training, he was well placed to handle the paperwork that was needed to set up a recycling unit. He was proud that getting a licence ("*licence banwana*") took him three months, while the very same process would take others a year. During my time in the market I met people who had been waiting to get a licence for years (see also Corwin 2018a; Taskar 2021). When Amit and I pushed him on why they felt the need to get into official recycling, he responded that they had been convinced and educated by Sahih Kaam, which I supposed in my notes would count as "awareness." He also said that even the market in Kabadabad will be shut down one day and they wanted to be prepared for that. Later, he also told me that he had become a criminal lawyer in the hope of making good money, having seen many relatives get embroiled in criminal cases. However, having his ambitions satiated by becoming an advocate, he was disappointed by the money, so he sat about to research the requirements for getting a dismantling licence. As I developed a deep and long-lasting friendship with Mohsin, I also realised that he was a young man earnestly looking for ways to better his life and at the same time ambitiously striving to do something that will make a difference for the community too.

While Mahmood and Mohsin's family is a unique case of social mobility and awareness of wanting to do better, also it is revealing of the kind of aspirations that drive young Malik men to get into business. On our second meeting, when Varun and I met Mohsin and his business partner Jahangir in the latter's legal practice, they told us about how they came to start a dismantling plant together. Their accounts illuminated the horizons of earning money made possible for those in the e-waste business. Mohsin and Jahangir met, as the story goes, during their legal studies as fellow community members; later they sat in the same chamber in court when they discovered they were both doing research on how to set up recycling plants at the same time. They bonded over their shared goals. On this occasion, rather than the environmental responsibility narrative, they said they became interested in getting a licence when they saw other e-waste dealers starting to change their cars frequently after they had gotten into registered e-waste recycling. Their inspiration came from having seen elders and powerful men in the community earn their money from recycling

plants. They cited the example of Jahangir's relatives, the owners of 3R Recycling, upgrade their cars frequently. First, they bought a Royal-Enfield motorbike, then they got a Mini Cooper, then a Mercedes. Getting a licence or "*licence banwana*" appeared to be a sweet deal.

Varun interjected that 3R Recycling was infamous for not doing any work but having the most amount of EPR registrations and contributing to the bad state of the sector described in the previous chapter. At that point Mohsin and his partner did not consider that all those car upgrades came through suspect deals and "paper trading" (*kaagaz ka kaam*). The rumour was that 3R had all the contracts since they lived close to a key figure in the Central Pollution Control Board (CPCB). Jahangir, the son of a tantric practitioner of occult arts, was at the time about to be married into another one of the big recycling plant families. The rumour, Varun offered the details promptly, about his prospective in-laws was that they accompanied their business offers with a knife on the table as a threat. Although Mohsin and Jahangir did not say this, but from subsequent conversations it began to get clearer to me that the latter's interest in setting up a recycling plant came from the idea that one had to keep honour in the face of the in-laws.

The trajectories of the young men in this section demonstrate the aspirations that underpin entry into or continuation of the business. These aspirations centre around creating better lives expressed through the shorthand of the kind of car brand one gets to drive. Scrap dealing is not so much "a way out of poverty" as many environmental groups and the PRO supposed but it also has ethical underpinnings of what is "a good life" (Laidlaw 2014). Although the good life may be expressed through conspicuous consumption or material possessions, but over time it became clear to me that there was a striving for a higher good, too. The story of Mohsin is telling, for he had the chance to move out of scrap dealing but is now seeking re-entry into the business as a registered recycler. Mohsin's and Jahangir's motivation may be making money the Malik way, but they found a niche in doing work alongside Sahih Kaam in an environmentally responsible way. In their story one can see the impact that the PRO aims to have through having established relations with informal sector actors, which makes up one out of the figures standing for relations with waste aggregators. At the same time, while to understand fully these aspirations, especially the motivations of Shahjahaan to get into the e-waste business, it is important to examine how ordinalisation works among the Maliks.

Categories of weddings, judgments of worth

Hanging out with Mahmood, in the warehouse over time, I learned about the ordinalisation of marriage offers. The two friends, both unmarried and around twenty years old, together ran the warehouse that supplied Sahih Kaam with the largest tonnage of e-waste in Delhi, mostly because

they were selling CPUs, central processing units, the bulkiest of all targets. While their hired labourers were working in the courtyard, they often lay around scrolling through their phones on the high bed in the dingy front room of their warehouse. I often joined them there for a chat or some afternoon refreshment. On one of these lazy afternoons, the boys were teasing each other. Both had already had their weddings arranged by their families, but in neither case could the families agree on the dates and, so, the events kept being postponed. As they chatted, Parvez started pulling Mahmood's leg for having had his wedding postponed again, "are you hoping they'll give you an Audi?" Having found a fun topic to pass time, Parvez kept repeating that the postponement of the marriage date must have been intentional to bargain up the dowry.

As I started asking about dowry, Parvez explained that the dowry was determined and ranked according to the make of the car that the in-laws (*larkiwale*) would gift the boy's family. If the in-laws would give a Maruti Alto, at the bottom of the hierarchy, it was understood to come with 2-3 lakh rupees (2000-3000 GBP) in cash. "Mind you," he hurried to add, "this is not compulsory, no one demands anything. It's the girl's family that wants to give." One level up, the *larkiwale* would offer a Honda i10 or a Maruti Swift, and the gift would be accompanied by 5-6 lakh rupees in cash (5000-6000 GBP). This is followed by the SUV category including the Mahindra Scorpio, an Indian jeep make, that comes with 12-15 lakh rupees in cash to the groom's family (11000-14000 GBP). The chart-topper, according to Parvez, was the Toyota Fortuner accompanied by 81 lakh rupees in cash (around 78,000 GBP). What surprised me was that the list with almost the same numbers was corroborated by multiple people.

The make of cars offered in marriage, I was explained at another time by Mohsin, indicated one's class background. "We, for example, are on our way from poor via lower middle class towards luxury." As part of the explanation, he explained his schema of the class system: below poverty line, poor, lower middle class, middle class, upper middle class, upper class. Those who drive Hyundai i10 and Maruti Alto belong to the lower middle class, the middle class drive Suzuki Swifts and Mahindra XUVs, upper middle class goes around in SUVs and the upper class drive Mercedes. "We drive a Suzuki Swift Dezire," he said as a caveat, "but we bought it second hand, so I think we are lower middle class." For Mohsin, "it is different if you buy an SUV yourself or if you are given it in marriage. Parvez, they are middle class, his brother got a Mahindra XUV in marriage." In light of that, Parvez could hope to get even more money and an even better car, for prospective in-laws would refer to what married brothers had received previously and would have to offer a better deal.

There was a sense that Malik weddings had also become more ostentatious in recent years. Another friend, Musharraf, who was also present and was the youngest of four brothers, had a longitudinal perspective on the changing dowry patterns. He recounted that his elder brother got married eighteen years ago and received a bicycle and 11,000 rupees, while thirteen years ago the next one in line received a scooter and 31,000 rupees. The third married 6-7 years ago and had received a Hyundai Santro, but no cash dowry. Finally, more recently they got a sister married and offered a Swift and 6 lakh rupees in cash (6000 GBP). As I listened to this, it struck me how from the dowry history of a family one could see the social mobility of not only the family but also of a whole community. For weddings were more than just family affairs, plus stories were also matched by other stories.

Mohsin, despite his tender age of 26, has been married for nine years at the time of my fieldwork. I interviewed him on their tenth anniversary with his wife and they told me their love story, while taunting each other for the other having ruined their life. "*Mere gharwalon ne zyaada maal diya tha, to usko maal accha lag raha tha* [My family gave a lot of stuff, he liked the things]," said Sayeeda with pride in her voice indicating that she did not come emptyhanded. Mohsin received a Hero CBZ motorbike in marriage, an offer two steps down from a Maruti Alto, and 81,000 rupees. "*Ab mera rishta hota, to iska* ten time *zyaada hota* [If I were to be getting married today, I would receive up to ten times more]," he hastened to add. This, despite the fact that he insisted that when offers came for his younger brothers who had only recently gotten married, right after I left fieldwork, they told off the girls' families and told them "Our boys are not for sale, if we like the girl, we'll take her." The story highlights how the amounts received in each marriage deal are widely understood as judgements of worth on the men and their families, and the same was the case with the dowry offered by the *larkiwale*. At the same time, the amounts exchanged also threatened to undermine the emotional bond that developed between two people, which was expressed through playful taunts flung at each other. Thus, Malik's way of ordinalising relationships had a similar tendency to slide into nominal judgements on the *hesiyat* position of families' to Sahih Kaam's deliberations on which brands to establish client relationships with.

The system of dowry has been highlighted as a social ill along with child marriage in colonial times, and is regulated by The Dowry Prohibition Act of 1961, which has been brought into effect in the effort to combat dowry related crime. The act also stipulates that gifts given without demand are not illegal. Dowry is a South Asian institution that is supposed to be a Hindu custom carried on after conversion by groups such as the Maliks. Everyone insisted that dowry is not demanded by the boy's family but is given by the girl's father willingly. However, when probed further, it turned out that the *bicholia* or the middleman can play a very important role in working out the details of

a connection and of what the appropriate dowry would be. Dowry amongst the Maliks consists of three parts, the car, or more recently money for the car if the family already has one, a corresponding amount of cash, and household goods: clothes, bed, wardrobe, pots and pans of all kinds, white goods, a set of porcelain and a set of plastic plates and bowls, etc. The full set of gifts are usually put on display and are carefully photographed to be put into the wedding album, the pride of many housewives, to be shown around when someone comes to visit, or becomes a new friend. However, the most interesting part was the exactitude with which everyone remembers the make of the car given and the accompanying cash as part of the transaction.

*Rishta*s (relations/matches), however marginal they seem to appear to making e-waste responsible, tell a wider story about the Maliks' place in contemporary India. With the country's liberalisation in 1991 through the reforms passed by the Narasimha Rao's government, certain processes were set in motion. These processes unsettled some of the ways in which India and Indians had been thinking of themselves since the country gained independence from the British in 1947. In particular, there was a shift in values from the asceticism of the Gandhian ideal and the frugality of Nehruvian Socialism to one of rampant consumption that accompanied liberalisation (Doron and Jeffrey 2018). In turn, these brought a change in the composition and definition of the middle classes (Fernandes 2000). Prior to 1991, the middle class in India was a thin layer of bureaucrats and employees in state enterprises who lived a comfortable and stable life on government salary and provisions. With liberalisation, the former middle classes were left behind and overtaken by a new urban middle class that rose alongside the spectacular growth of the Indian IT sector, bringing with it an acceleration of consumption and aspirations (Upadhya 2011). The Maliks are latecomers to the game, seeing that around 2000 Musharraf's brother received a bicycle and eleven thousand rupees in dowry, but are fast catching up through taking part in conspicuous consumption, especially centred around the occasion of weddings. Marriages can be an occasion for social mobility, too (Osella and Osella 1999).

Thus, weddings and the gifts that are exchanged in the run up to and during weddings, while marking the continuation of tradition, also effectively become markers of how the Maliks keep up with Indian modernity and liberalisation. They are markers of the social mobility that the group had been able to attain due to their various trades, in particular dealing in second-hand materials and e-waste. At the same time, this becomes an interesting case of valuation in the schema drawn up by Fourcade. "Most social orders in history have consisted in an explicit ordering of different kinds of people: Caste, above all, but also race, estate, class, gender, ethnicity, region, citizenship, and territory appear not only as differences but as differences that exist in a hierarchical, that is, an inferior-superior, relation between kinds: men-women, natives-foreigners, colonizer-colonized,

and so on" (Fourcade 2014, 180). Muslims and, among them, the Maliks are nominal categories that are supposed to indicate merely what community the individuals belong to, without any hierarchical ordering according to the Indian constitution. Yet, Muslims have been cast as inferior in Hindu India's ordinal judgment of worth and it is being argued that significant sections of the Muslim population have been left out of India's development (see discussion on OBC status in chapter 2). A worrying tendency under the Modi-led Bharatiya Janata Party (BJP) government is that India is being increasingly defined as a Hindu *rashtra* (state). Yet, some Muslim groups at least had managed to take advantage of the fallout of Indian capitalism, without being part of India Shining and participating in the IT-sector and private-sector boom (Upadhya 2011). Rather, by becoming *kabadiwallas* or scrap dealers, collecting electronic and other discarded items and selling them on within the caste network, they had become part of the growing body of consumers. Through consumption, they are able to define themselves anew, laying claims to the status of the owner of this or that car make and having made a wedding of a particularly high value. As part of that move, the negotiation of dowry and the resulting agreements, on the make of car or the sum of money given, also function as ordinal judgments within the caste itself. They provide hope for the aspiration that the community can escape being second-class citizens (Fourcade 2014).[22] More than that, weddings also show the particular ways in which Maliks "convert wealth into capital" (Weber 1968), mostly as better kinship relations which contrast interestingly with Sahih Kaam's conversion of business relations. Maliks collectively as a group, and individually, can assert their own worth that arises from their entrepreneurial habits, which give them leverage in negotiating dowry. This contradicts starkly Weber's claim that status groups obstruct the workings of the market, for large sections of Indian society are brought into relation with the market precisely through status group practices.

Negotiating a "sahih jodi [the right match]"

Contrary to my expectations, getting more money or better cars were not always preferable. Since the dowry was based on the *hesiyat* (rank, wealth, position, *capacity*) of the boy's family, they also had to show that they were deserving it. Each type of wedding detailed above has a set amount associated with it in terms of what the boy's family must spend on the reception. In Islam, there

[22] A hope that is thwarted by some recent laws, which garnered considerable opposition in early 2020. The Citizens' Amendment Act stipulated a pathway for religious minorities from neighbouring countries to claim citizenship in India. The exclusion of Muslims from the listed identities came as a significant one after the Rohingya crisis. Even more so, paired with another proposed law that would make the registry of all citizens compulsory, the act threatened Muslims across India with a loss of citizenship. The controversy erupted towards the end of my fieldwork and, thus, I was not following it in all its details, but the anti-Muslim riots of February 2021 broke out in this strained context and were localised around the area where I did my fieldwork.

is not supposed to be any distinctions based on caste. However, there should be parity between the status of the marriageable partners. I would often be asked whether a match was right [*Jori sahih hai*?]. This question invariably meant to ask whether the couple looked good together. However, when making matches, the aspect of parity was a matter of capacity to pay up. The Maliks continue to marry amongst themselves, but since there are considerable class differences within the caste, thus, determining the status of the families is an important part of weddings.

When my friend Shaheed, the seller of keyboards and dismantler of CD-ROM players, finally got ready to be married at the age of twenty-eight, a ripe age for an unmarried man in the community, I found out that, contrary to my expectations, grooms' families do not always go for the highest bidder. One night we were sitting in Shaheed's and Samir's godown, where I often passed time. Shaheed and Samir were the two youngest of six brothers all engaged in e-waste dismantling. The two eldest lived nearby in separate houses with their families, while the four younger ones, two married and two unmarried, lived in one household with their mother. On that night Rashid, the eldest brother in the household, came to sit with us in the warehouse before they would return home together to discuss the matter of marriage.

The brothers were excited about an offer that had come through a relation living in one of the backstreets. The excitement was about the beauty of the girls in the family, as they tried to figure out which of the three daughters might be offered. The nearby relation, acting as a *bicholia*, asked them what kind of wedding the family wanted for Shaheed who, due to their limited means, replied "a cheap wedding." The girl's family also lived in one of the neighbouring streets but were living on rent, which information dampened the brothers' enthusiasm. Shaheed's family was by no means as well to do as Mahmood's and Mohsin's but had recently bought their own house in the street behind the warehouse. Another serious drawback in their eyes seemed to be that the girls' family was local. In-laws are better if they are at a distance; if they are too close, the woman might want to go back to her *maika* (father's house) too often, and the son-in-law would not be treated with the same *izzat* (respect) as when they see the in-laws less regularly. As if to prove Shaheed's and the family's worth, Rashid also mentioned that there was a *rishta* that came in which offered a Maruti Alto, the lowest category of four wheelers according to the car make hierarchy, but they had to refuse. The first reason Shaheed offered was that he had set his heart on a Royal-Enfield, an iconic Indian motorbike with a classic shape and a deep impressive motor sound. The second reason, offered as if an afterthought but I suspected it to be the weightier one, was that an Alto would draw with it the obligation to spend about 10 lakh rupees (9000 pounds) on the wedding.

The negotiations that go into finding the appropriate marriage partner for a son are perhaps comparable to the negotiations that determine the compatibility of the PRO and the brands. Furthermore, the marriage transactions among the Maliks are also an extension of the transactions in e-waste. As Gayle Rubin argues the centrality of a political economy of sex, research "must take *everything* into account: the evolution in commodity forms in women, systems of land tenure, political arrangements, subsistence technology, etc. Equally important, economic, and political analyses are incomplete if they do not consider women, marriage and sexuality" (Rubin 1975). In this case, the traffic of women helps understand the social mobility path that the Maliks have been on for the past two decades of e-waste recycling. My first impression was that getting married was a great way to earn liquid capital for doing business, but once I heard the figures of how much must be spent on the reception and gifts to the in-laws, this preconception quickly dissipated. By the end of each affair both parties appeared to have gotten impoverished, only the cardinal numbers that made up the deal to be remembered by one's relatives. It appears that this is a very expensive way in which a community measures the worth of its members.

In addition, I would risk offering another interpretation, which has to be examined more in depth, namely that marriage exchanges are also the way in which the community equalises and spreads the benefits of social mobility evenly. The voice of my non-Malik neighbour, the eighteen-year-old Shalu and daughter of the asthmatic, out-of-work property dealer from Chapter 2, echoes in my head as she muses over the Maliks' wealth, "They are all rich, because they do number two work [*Sab paisewale hote hai, kyonki do number ka kaam karte hai*]." She then asserted that Hindus can get ahead in life with honest work, they teach their women, because they do not think about each other. However, Muslims stay behind, because once one of them is successful they make sure they help each other. If one examines Shalu's claim, one begins to see the cracks in the argument. Yet, what matters for me in this case is the widely shared assumption that Maliks earn their wealth through illegitimate means and the idea that for them economic success is not an individual thing but must be shared by the community.

Conclusions

This discussion illustrates why when asked if Sahih Kaam was making an impact, I was at a loss as to what to answer. On the one hand, I should have said "no," if impact is to be interpreted in terms of Sahih Kaam's ethical project of becoming the most environmentally responsible PRO. Nevertheless, saying that there was no impact would have been problematic to sustain from the Maliks' point of view, who had clearly benefitted from the trade with the PRO. The question remains unanswerable because the two parties to the e-waste transaction were participating in it

following widely diverging rationales. Both parties, however, agreed that establishing recycling plants was the way forward, for Sahih Kaam this meant an improvement to the way e-waste is recycled, while for the Maliks it meant the logical progression in social mobility. However, neither one of them can be understood as anything less than a collective ethical project in search of the good.

At the centre of this discussion on the ordinalisation practices at the PRO and among the Maliks lies the question of ethical self-making and its uneasy relation to making profit. For the PRO, making and delimiting relations broadly for the pursuit of profit involved keeping in mind the goal of accumulation through building a clean, transparent, accountable image. The question of ethics is formulated as part of the question of accumulation in infrastructural projects (Bear 2020). Bear traces the shifting arguments around financing the Indian railways in three different epochs, under colonialism, post-Independence, and post-liberalisation, to argue that profits from financing infrastructural projects accrue not just in monetary terms but in terms of the wider vision of the financing scheme. Bloch and Parry's discussion of the morality of exchange (1989) showed that there is benefit in separating shorter- and longer-term exchanges to think through the different ways in which exchanges can also be involved in the "reproduction of the social and cosmic order" (2). Yet in the case I examined, as in Bear's financing of the Indian railways, it is not only about the reproduction, but also about the creation of a new cosmic order. In the case of e-waste, this new value regime is based on principles of toxicity, environmental sustainability, and responsibility. While other actors may have read the situation differently, pursuing profits at the cost of environmental responsibility, Sahih Kaam understood the new logic of value to mean earning profits from doing environmentally responsible work and, at the same time, pushing other actors to do the same.

In pursuit of these ethical goals, both Sahih Kaam and the Maliks rely on making certain kinds of relations and not making other ones. While on the surface it appears that the business relations of Sahih Kaam differ radically from the kinship relations of the Maliks, yet both can be seen to frame their relations in terms of creating, maintaining, and extending their capacity to create value—profit and status—which are hard to untangle. The kinship relations of the Maliks appear as hard calculations behind a business transaction, while the PRO's relations with the brands carry the delicacy of kinship with the potential to affect the status of the company. The Maliks do not make kins to do business with them, for they follow competitive patterns of extended kinship. Rather, they make kins to establish their own honour and worth. One of the reasons why Jahangir needs to establish a recycling plant is because his in-laws are recyclers, and he cannot fall behind them in status. At the same time, there is no indication that Jahangir's company would hope to conduct

any business with his in-laws. In fact, when Ashraf's prospective in-laws came to suss out business secrets, they were met with significant resistance. The relations between the PRO and the brands are more intimate since the image of the one reflects on the status of the other. Nevertheless, the parallel breaks down when considering the short-term nature of the contracts drawn up between PRO and brands. At the same time, the PRO's deliberations on how they choose their clients can also be seen as- in pursuit of improving status, both collectively and individually.

The most far-reaching effect of the e-waste trade, not just with Sahih Kaam but as a whole, is the social mobility of the Maliks. Marriage transactions seem to be at the heart of this process as, although large sums of money change hands, yet, when everyone had fulfilled their obligations, barely any money is left of it. Instead of individual gain, then, which is what informal e-waste recyclers are usually accused of pursuing, the purpose of these marriage relations may be to engage in the collective ethical project of social mobility at a caste level. These results confirm earlier studies on caste, which have shown that although one's caste cannot be changed, yet an entire caste can rise or sink in status because of economic fortunes and the transactional relations in which it takes part in.

Thus, based on the above, I argue that the purpose of environmental responsibility and sustainability requires the participation of different groups of people to come together driven by an investment in very different types of ethical projects. Even in the context where environmental responsibility becomes expressible in terms of money, making profits is caught up in relations with other kinds of value, ethical and otherwise, becoming the means rather than an end in itself. In the next chapter, I will extend this argument to examining what it means on an individual level to take part in the value chain, either for *kabadiwallas* or for Sahih Kaam employees. The discussion circles around the question of the skills necessary and acquired for navigating the market.

Chapter 6 The knowledge of e-waste: labour and value in Kabadabad

The last two chapters are about the claims to knowledge about e-waste, which make labour productive of value. Claims to knowledge appeared to describe individuals' capabilities of value transformation in the e-waste sector relative to the sphere of exchange and boundaries of the different value regimes. When I first arrived at Sahih Kaam, in my first meeting with Satkar I was given to understand that the company knew the e-waste sector better than anybody else. Once I became well acquainted with the *kabadiwallas* I understood that they also measured their capacity to effect value transformations in terms of knowledge possessed. Thus, the following two chapters examine what these claims to knowledge implied in their context and in terms of the work across the different implications of e-waste as a boundary object marked by an interpretive flexibility (Bowker and Star 1999; Star 2010). Through claims to knowledge I examine the e-waste scrap work as working with this interpretive flexibility across the different value scales (Guyer 2004) that e-waste operates across and as acquiring a "mastery" of shifting and modulating between these as way to creating new economic value (Elyachar 2005).

I begin in this chapter by looking at what the claims to knowledge mean in the informal e-waste market in Kabadabad. I examine especially the way in which knowledge was circulated and withheld to make deals, create competitive advantage, and also to keep the market going. What does it mean to have "a knowledge of e-waste" in Kabadabad market? This discussion forms the basis of the next chapter which will focus more concretely on waste work.

The knowledge of e-waste

Squatting on sacks of scrap in Shaheed's warehouse provided me the best vantage point over the dispersed and disaggregated scrap market in Kabadabad. The tight urban sprawl of autoconstructed houses was carved out from the agricultural lands of a Gujjar village on the peri-urban frontier of Delhi.[23] The streets where dealing went on are recognisable from the shabby wares that spilled onto the rugged pavements and ledges covering the open drains. To recognise

[23] The Gujjars are a caste listed under the category Other Backward Castes for the educational and occupational inequalities they experience in contemporary India. They are considered to have been pastoralists by occupation, but in the recent decades, as the boundaries of the megacity had expanded and the villages where they owned land had become part of the city, they benefitted from selling land for urban development. The Gujjar compound was pointed out to me regularly in the backstreets of Kabadabad with a gesture that indicated both appreciation and disapproval. The two, three-storey houses looked more like the bungalows of the wealthy and privileged parts of Delhi and were at striking variance with the cramped streets and multi-storey autoconstructed sprawl that surrounded them. The grand houses with access roads, but without any compound around them, indicated the lifestyle of the nouveau riche.

the streets as the sites of the market and to make a deal seemed to be worlds apart, for this was not the open market where anyone could just make a deal. Most shops were scattered between a few proximate streets where the locality undiscernibly gave way to the next neighbouring residential area. Yet, more than a physical space, the scrap market existed as knowledge of supply and demand in the heads of my interlocutors. Workshops and warehouses rarely operated according to any set opening hours. Shaheed's warehouse was often locked up even during the day, when he and his brother went home for lunch and an afternoon siesta in the neighbouring street, or when he went to the mosque to pray, or had business elsewhere.

The trade in e-waste is a semi-clandestine business and the dealers were at regular risk of police harassment. During the so called "sealing drives," the survival of one's business depended on being able to close before the cops got to one's warehouse, sealing it down, seizing wares, stopping dealings as long as one did not pay the requested fine or bribe to reopen. After a sealing drive, the whole market would be shuttered, without any sign of activity, and remained so for the rest of the day as if it was time for Friday prayers or holidays. When a warehouse was sealed, the scrap dealer would count his losses, usually a load or two of material at different stages of dismantling, move onto another street, and set up his shop there.

Even when *kabadiwallas* were at work, they would often keep their door closed, in which case the absence of the lock from the outside gave the presence of the proprietors away. Among the towering buildings, getting higher every year as a new floor was added once another son got married, some buildings retained the shape of village houses, squat and low with a courtyard in the middle. From my neighbours' balcony one could look into the courtyard of a workshop next door, where workers were breaking cathode ray tube monitors (CRT), but one would not know what went behind closed doors when walking on the street.

Shaheed's warehouse provided the perfect vantage point, because even when he was out, his brother Samir would usually be squatting on the floor engaged in breaking CD-ROM players and sorting the resulting materials. The devices appeared to be bursting apart with the lightest pressure applied on the right spot. Once separated, with the same move Samir threw plastic to one corner, steel in the other, and the material for further separation in the third, creating piles sloping up to the ceiling. I sat close to Samir and would light a clandestine cigarette ("careful plastic is flammable," he warned) until Shaheed would return from "having done the rounds of the market [*market ghumna*]." This meant checking out a consignment of keyboards, CD-ROM players, or chargers at someone else's shop or looking for the same items in the *khatta*, the open space strewn with garbage where *pheri-phere* Maliks held open markets (chapter 1).

Shaheed would say, "*mere paas* knowledge *hai* [I have knowledge]," which I heard echoed by other scrap dealers too. Mahmood would also say with pride, "*mera* e-waste *ka kaafi* knowledge *hai*. [I have quite a bit of knowledge in e-waste]" This claim to knowledge was at odds with how PRO employees attributed the state of the e-waste market and the continuation of informal e-waste trade to the lack of knowledge among scrap dealers. Yet, Shaheed's pride in his own knowledge meant that he could take a look at a bag full of CD-Rom players and roughly tell which ones were the more valuable pieces, which one would go for *challu* (working order) and which one would provide good returns as scrap. It also meant that he had the established connections and the relationships to know when a new consignment had arrived. He also had access to a good repertoire of buyers, who would buy the odd working order item and the steady stream of plastic, steel and copper and gold containing PCBs and reader lens. Plus, he had also built a solid exchange relationship with Sahih Kaam, selling keyboards as a whole.

Thus "knowledge of e-waste" meant being able to effect material transformations in relation to the knowledge of how value is created in the scrap value chain (Sanchez 2020). Sanchez emphasises that despite the social stigma and the theoretical dismissal that scrap work has received, it is a satisfying form of work. He found that in the scrap yards of Jamshedpur, despite the ritual stigma that adheres to the work, scrap work requires developing discernment between different materials and a sense of how objects break apart on a tactile level. Sanchez discovered that breaking things gives satisfaction similar "to feeling of building things" or "solving a puzzle" (Sanchez 2020, 70). Scrap work produces value by measuring up the possibilities of material transformations, including the interval scales of value discussed in detail in chapter one, to the economic value that can be produced from them. Yet, Shaheed and Samir did not talk about satisfaction when I would visit them in the workshop. I would ask what they were doing, and the answer would invariably be "nothing, just passing time [*kuch nahin*, timepass]." The use of the word timepass shares some aspects of, but is also at variance with, how Jeffery (2010) documented the empty time of boredom of unemployed youth. In Shaheed and Samir's words, timepass was the empty, non-exciting time of labour, which perhaps indicates the hierarchies of labour value, as e-waste dismantling is perhaps not the most highly valued form of labour and one that is taken up in absence of more prestigious forms (Gidwani 2015). They did refer to good working days with the expression "the hand keeps moving [*haath chalta hai*]," and bad working days as "the hand isn't moving [*haath nahin chalta*]." Disappointing days could be caused by anything from family problems to the lack of availability of items in the market. The expression also indicates how monotonous e-waste labour differs from the labour in scrap yards where a more diverse selection of objects waits to be dismantled. Shaheed's and Samir's business was based on taking apart a mass of similarly shaped

objects, the practice of which allowed them to acquire the skill to break objects apart in a nick of time giving the impression of explosion. Thus, knowledge lies in knowing the materials, how to transform them, but it is not enough, for they have to be broken purposefully to maximise the price they would fetch in the market.

Knowledge in Kabadabad included but went beyond the question of material transformation, to the marketing of materials, an aspect which is less developed in Sanchez's article. Knowledge also meant something more akin to the embodied "mastery" of workshop owners that Elyachar documented in Egypt (Elyachar 2005). She argues that "[m]astery is a specific form of power" which is generated "within a specific cultural setting" (Elyachar 2005, 101). Cairo craftsmen also gained mastery by creating a market for their products extending their selves outwards into a network of regular clientele. In Delhi's scrap market *kabadiwallas* did not express themselves by creating the market, rather the knowledge of e-waste also meant gaining the power to participate in a network of exchange relations in the market. Given the fact that the object of labour is destruction rather than making things (Sanchez 2020), the marks of authorship do not provide a way for *kabadiwallas* to distinguish themselves (Cant 2018). In fact, *kabadiwallas* are often in close competition with each other, breaking the same kind of things as the trader next door with nothing to set them apart. In this context, knowledge means knowing a good supplier, knowing what type of material transformations to effect on a specific type of object and where demand for the resulting factions might be. Holding onto such knowledge establishes one as a node in the value chain.

Knowledge of supply and demand becomes emblematic of the labour that is required for effecting the transformation of revaluation. Yet, the real mastery is in getting to know knowledge while also withholding it from others.

Limits to knowledge

Keeping knowledge from circulating

On most occasions I found Shaheed or his brother Samir alone, but other times someone or the other came in for a chat and to do some business. On this occasion it was a relative, Jaleel from Bombay, who dropped in on Shaheed to offer him a truckload of keyboards. He sat on a tall sack full of e-waste and they explained to me that he had come from Bombay to sell his *maal* (stock). They were discussing the fate of a consignment of keyboards when Hassan, a regular at the workshop and a fellow Sahih Kaam aggregator, entered. And as soon as he did, Shaheed said quickly to Jaleel, "*Ab chup raho* [Now be quiet]!"

Asalam valekum, Hassan greeted us, while his large good-natured eyes took us all in. Recognising Jaleel he immediately asked, "Have you got any keyboards?"

The situation was awkward. Having been told to keep quiet about the keyboard deal, Jaleel looked down and around the dingy room. He first mumbled in contradiction, then started on a different topic, "Do you know anyone who needs motherboards? I have 850 kgs—800 kgs single and 50 kgs double printed."

As the discussion has thus been cut short, Salman took his skullcap to set off to the mosque with Hassan in tow. "Are you not coming?" he asked Jaleel.

"No," Jaleel declined.

"Will you not read *namaaz* [prayer]?"

"I will."

"So come with me?"

"I won't come now, I'll read *namaaz* later."

Jaleel instead preferred to stay behind and question me about what my business was in the market. It was exactly this that Shaheed wanted to avoid due to similar reasons that made him stop Jaleel from talking once Hassan appeared. This was Shaheed's way of keeping himself and the node he occupied in the market valuable. Had Hassan gotten wind of the new consignment of keyboards he might have wanted in on the deal. At the same time, Jaleel could establish a direct relationship with Sahih Kaam through me. Shaheed had once admitted that the possibility of linking up more scrap dealers with the company stopped him from facilitating meetings between me and other scrap dealers in Kabadabad.

Knowing a steady buyer like Sahih Kaam meant having an advantage. When the company's visitors came to ask questions about the PRO's impact, Shaheed responded that being an aggregator meant being able to sell items whole without having to spend labour time on opening them. However, the more dealers signed up to sell to Sahih Kaam, the more power the company would have in bargaining down the price. As targets were limited and more suppliers would fill them up faster, Shaheed's cut of the cake would also be smaller. This is why Hassan, who was already selling to the company, had to be kept out of the know of the next supply of keyboards that Jaleel had brought. The relationship with Sahih Kaam was not unique in any way. The example of Anas Malik, who I also met in Shaheed's workshop, also demonstrates the stakes in knowledge circulation. Anas Malik, a young cocky man of sixteen and proud of his business acumen, told me the following story. He dismantled TVs and had a steady buyer for the transformers who, in turn,

sold them to the other side of the city to a manufacturing company. Anas one day got up and followed his buyer and found out where he sold the transformers. He thus bypassed the middleman to sell directly to the manufacturer. An example of already existing circularity, this also shows that the ultimate threat for closing knowledge gaps would be that Shaheed could be eliminated altogether as a middleman if the man from Bombay would be recruited to sell to Sahih Kaam directly. Knowledge of supply and demand was then the most important capital. And manufacturing an appearance of scarcity through practices of secrecy was the way to counteract the fierce competition in the scrap market.

The exchange between Shaheed, Nadeem and Jaleel goes to the heart of what I mean when I argue that knowledge, the knowledge of where to buy and where to sell, operates and patterns the Kabadadabad market. Without knowledge, knowing where Shaheed's warehouse is and that he buys CD-ROMs and keyboards, the Bombay man would be lost as to where the market lies and who to sell to. If someone wanted to buy scrap, they would need to know Shaheed or Hassan, and even if, like these two, someone already owned a shop on these streets, they would still have to know people like Jaleel who would periodically bring CD-ROMs, keyboards, and motherboards from Bombay. At the same time, such knowledge of relations also had to be protected. For if Salman could no longer prevent Hassan from selling to Sahih Kaam, since the trade relation had already been established and the two parties had already gained knowledge about each other, he could stop him from learning about the particular keyboard consignment that he was about to buy. I often found myself the subject of such machinations. I was often told of things with the caveat that I should not tell this or that person what I know. It was Hassan who on another occasion told me that my research assistant and I could, in principle, go to the *khatta*, the open space where the hawker Maliks were selling e-waste on the open market, but we should not tell them how much Sahih Kaam was buying for. The warning suggested that he was worried that if the hawker Maliks were to get wind of the selling opportunity, they could start selling to Sahih Kaam directly, cutting out Shaheed and Hassan as middlemen.

At the same time, the exchange between Shaheed, Jaleel, and Hassan also shows that in fact such knowledge was not hard to come by at all. In fact, knowledge circulated through exchange (Appadurai 1986). Appadurai in *The Social Life of Things* while primarily occupying himself with arguing that the source of value is exchange and not the other way around, also devotes a significant section to the issue of knowledge (Appadurai 1986). The search for reliable information has been central to the study of markets (Geertz cited in Appadurai 1986). Appadurai emphasises that the circulation of commodities is not only accompanied by a circulation of knowledge, but is also shaped by knowledge and, its opposite, ignorance. Knowledge circulates alongside

commodities as supply and demand fluctuates in market, as workshops fold or are closed in "sealing drives," making it possible to keep trading. Appadurai takes time to discuss knowledge flows in terms of the distances that commodities travel. He distinguishes between "long-distance intercultural flows" and "more homogenous, small-scale, and low-technology" commodity flow. Merchants, then, can become bridges in cultural and knowledge gap between producers and consumers giving the example of the opium trade in Asia and the Middle East and New York addicts. While Appadurai is not so much focused on the act of bridging, the idea becomes quite central to the argument here. As Polanyi says: "Carrying may, in early times, loom larger than production; and even later it plays a preponderant part in production itself. It has been asserted before that production can be reduced to locational movements of objects" (1977, 32). In Appadurai the circulation of knowledge causes the "infinitesimal specialisation of commodity production or its inverse – the distance between a particular bulk commodity (such as, say, copper) and the hundreds of transformations it will undergo before reaching the consumer" (Appadurai 1986, 43). Rather than the planetary distance travelled by opium, the distance being bridged is between the household and public and private sector offices where e-waste accumulates, and the place of processing. Maliks' knowledge of supply and demand, where each dealer keeps track of one item's availability and requirement in a particular form, operates a more efficient collection channel than any formal entity could come up with. Although there is no indication that the scrap dealers, the middlemen, bridged the gap in one go, but rather through a series of steps where every dealer knew just enough to keep e-waste flowing through.

Thus, in this section I argue that success in the market depends on the acquisition of knowledge as a market niche which, if maintained as exclusive, can be monetised. Keeping knowledge to oneself in the e-waste market is not easy since social life entangled in exchange relations bleeds information. While all markets depend on, as well as facilitate, the circulation of knowledge, here small acts of trying to limit such circulations of knowledge come to the fore as a specific market activity.

Looking for gold

As Shaheed left for the mosque, I remained alone with Jaleel, which he took as an opportunity to quiz me. Curiously, the discussion did not flow, as Shaheed was perhaps worried it would, towards my association with "the company." Jaleel was less interested in linking up to sell directly to Sahih Kaam. Instead, he asked me if I was here to extract gold (*sona nikalna*). With his questions, he propelled my attention to another kind of knowledges that are required to extract value out of e-waste, that is, the knowledge of transforming materials from waste to precious metals.

I responded that I was not aiming to remove gold myself but admitted that it would be nice to speak to someone who does. This elicited the regular response to my presence in Kabadabad: "No one will tell you how to extract gold," usually said with great satisfaction as if keeping a precious secret. While workshops in Kabadabad dismantled objects and separated factions, the materials containing gold and copper made their way into *bhattis*: unofficially operated smelters in villages just across the Delhi border to extract the non-ferrous metals. The value chain in Kabadabad was responsible for feeding these higher-value, higher-risk extraction processes. The sentence was so regularly flung at me, almost as if to prove that I was wasting my time in the market, that it began to pique my interest. The question indicated that *sona nikalna* was considered the ultimate transformative skill in the scrap trade, while at the same time also considered to be the most polluting one. It was not surprising that there was a shroud of secrecy surrounding it. Even so, Sahih Kaam colleagues and I, found to our surprise that there are plenty of videos on YouTube explaining how to extract gold from printed circuit boards. When I told Jaleel of the videos, he also admitted to having been involved in extracting gold, but he stopped because he ran into losses (*nuksan hua*).

> You need to get the ratio right, then the rate of gold keeps falling and rising. Before, I used to do it with my brother. Now I am alone, my brother died. High blood pressure, blood went up into his head and got stuck (*jam gaya*). I've stopped extracting gold for the past four years. Now I only do trading. Not breaking, not recovering, just trading.

He seemed unable to resist admitting to having been involved in recovering gold, the most lucrative, toxic, and judging by his comment, even economically risky value conversion. Apart from Jaleel, I had met others, too, in Shaheed's warehouse, who had said that they used to do it before, but no longer found it profitable. This was a striking claim around the time that gold prices had reached an all-time high, doubling between the time I arrived at the field and when I left. No one ever gave me a more detailed answer than Jaleel as to why they had stopped recovering gold. The riskiness of the material-economic practice expressed indicates that more skills were needed than what is required for either breaking or trading. Once Shaheed returned, Jaleel also talked in the form of banter of a Shi'a community living across the city border, who were successfully recovering gold and making good money out of it. As with trading among the Maliks, sometimes the requisite capability was linked to community background.

The regular assumption that I was after gold recovery and the immediate denial that no one will show me how it is done, hinted at the same mechanics and centrality of knowledge to the e-waste trade. Knowledge of materials and their transformation was a thing to protect from others to keep

comparative advantage in the market, despite the insurmountable challenge of being able to limit its circulation. Since the scrap trade has a low threshold of entry, the pool of *kabadiwallas* or scrap dealers keeps widening, and the competition keeps getting fiercer. Increased competition may be the reason behind experiences of dwindling supply, rising prices, and languishing returns despite the corporate predictions that e-waste is an exponentially growing waste stream. There was an attempt to keep to the ideal of knowledge as exclusive, to keep its value high.

Failure of conversion

There were clear instances of the failure of a deal to result in the expected transformations. While the Maliks in general, and Shaheed and his friends in particular, made significant profits trading in e-waste, there were points when they also failed to make the calculated gains.

On one occasion, for example, Shaheed, Hassan, and Sarphoo, a third friend, got together as partners to buy 6000 keyboards in *challu* (in working order). This time Shaheed invited me to go along with him to Sarphoo's godown to hang out with them while they were replacing the missing buttons on the keyboards. On this occasion, I drew the stack of scrap that I was sitting on closer and got down to replacing buttons myself despite the protestations from the trio ("this is not your work, your work is to study" [*aap ka kaam yeh nahin hai, aap ka kaam padhai hai*]). Sarphoo instructs us to make sure that we replace the right buttons, otherwise the keyboards cannot be resold as *challu*. For the first couple I could see everyone was making an effort to find the right keys, they asked between themselves to check which key is missing. However, the longer we were at it, the less anyone cared, we started putting B instead of an S and a tab button instead of Caps Lock. Engaged in such a high concentration exercise, I suddenly got the eerie feeling of the fundamental difference between my level of familiarity with the keyboard (your work is to study) and theirs (this is our work). This is why for me keyboards are information carrying objects, while to them they are things that have the potential as commodities in the used electronics and refurbishing circuits. The trouble was that Shaheed, Hassan, and Sarphoo did not have the skills requisite for fixing the keyboards. The three of them invested 2–300,000 rupees in it, a significant portion of their liquid capital, but they ended up selling the stock piecemeal, which meant a slow return on the deal. In the end, they claimed to have barely break even, which highlighted the risk of trying to make a deal in an item one did not have knowledge of.

Selling to the PRO was not much more fool proof against failure. Shaheed's experience was often that aggregators do not get paid on time, as the PRO's capacity to settle bills is dependent on factors entirely outside of the e-waste market's sphere. On another occasion, Shaheed's investment in another load of 8000 kgs keyboards that he provided to Sahih Kaam barely paid off. First off

there was 10-15 kilos mismatch between the weight shown by the *dharam kanta* (weighing bridge) that was acceptable to the seller and that shown by the *dharam kanta* acceptable to Sahih Kaam. At the rate of what Sahih Kaam was to pay to Shaheed, which would come to 2,52,305 rupees (two lakh fifty-two thousand three hundred and five rupees) he claimed with the mismatch between the weights, he was only going to lose 6-8000 rupees on the transaction. The story highlights that even when someone has the knowledge to navigate the different value scales in the market, they might still come up against the problem of defective scales. A factor outside anyone's control, although indicating the inability of the state to regulate weighing bridges.

Worse still, after two weeks, Shaheed was still waiting for the bank transfer from Sahih Kaam. It came out when one day I visited the warehouse and enquired after the way business was going. I found both Shaheed and his brother dejected, without any CD-ROMs to break. When I asked what they were up to, they replied: "Nothing, we are sitting here empty-handed, doing *timepass* [*Kuch nahin, ham talli baithe hai, timepass kar rahe hai*]." And then he added: "There is no stuff coming from behind [*peeche se maal nahin aa raha hai*]." This was in stark contrast to the other times when steel and plastic were flying in the direction of the three corners behind them. Before I could have drawn the conclusion that the flow of e-waste was drying up in the market, Shaheed explained that there was a difference between making 20,000 rupees over 2–3 days than making the same amount of money in 15 days. He thought nostalgically of the early days of selling to the company, when the payment would arrive in his bank account within a few days. "Those were the days," he reminisced, "I'm not having fun anymore [*ab mazaa nahin aa raha hai*]." And true enough, the difference in his demeanour was striking. On good days, he would be wired up like a hunting dog on a wild beat, showing that the dynamism of making good deals one after the other was the good life for Shaheed. For, although he knew that the payment from Sahih Kaam would eventually arrive, yet, the delay in payments meant that his liquidity was caught up in the delayed payment. This, in turn, meant that he had no resources to go out and source CD-ROM players which could be broken while they were waiting for the payment. Here again, factors outside of the immediate informal market situation were affecting the actors' capacities for value transformation. It is not that Sahih Kaam was intentionally withholding funds. When the dealers besieged the representatives of the company, the latter explained that, in turn, the company was waiting for payments from producers and recyclers that would pay for the material.

Knowledge as value; valuing knowledge

Shaheed's knowledge extended to the "marketing" work and was complemented by the skilled physical labour of his brother in separating the plastics from steel, and optical drives from printed

circuit boards in CD-ROM players. This way, they made a successful living from these activities alongside selling keyboards to Sahih Kaam. When I asked him why he chose CD-ROMs and keyboards and not any other items, he responded: "My knowledge was in this [*Isme hamara* knowledge *tha*]." Consequently, keyboards and CD-ROM players were the items in which he apprenticed with his uncle, as did another one of the pair's elder brothers. When asked why he would not extend operations to making plastic pellets, too, he said: "How will the other guy earn his bread if I take over?" Besides the altruistic motive, he also admitted that he lacked both knowledge and money for entering this other line of trade. It is not that Shaheed made no attempts to extend his reach as the foray into *challu* keyboards demonstrated. A more successful endeavour of his to diversify was to get into selling chargers on behest of the Sahih Kaam operations team, who found that keyboards were cheaper in South India, where most of the recycling plants were anyway. The uneven access to knowledge provides an insight into how the high-level of division of labour was sustained in the e-waste market.

Sanchez also emphasises that scrap work requires an understanding from the worker of "what types of welding and bolts hold the machine together and what their weaknesses are vis-a-vis the tools at his disposal" (Sanchez 2020, 80). And: "The degree to which one is able to do things that others cannot has strong impact upon the security and compensation of one's employment" (80). While the emphasis of such knowledge and frequent claims to it do become the basis on which scrap dealers establish their mastery and control over the particular step in the value chain, yet this is not all. *Kabadiwallas* needed to know how each waste type came apart: which corner to exert pressure by hand and where to apply force by striking a chisel by hammer. In Shaheed's and Samir's hands, CD-ROM players and occasionally keyboards broke apart at the lightest touch, appearing to explode in a controlled manner. However, in addition to such technical knowledge acquirable by labourers, the scrap dealers also needed to have a range of social skills through which to gain the necessary information. Warehouses in central locations such as Shaheed's, were thus also places of sociality, where fellow *kabadiwallas* would drop in for a chat, emphasising the phatic labour that is included in "marketing" to keep open "communication channels, that can potentially transmit not only language but also all kinds of semiotic meaning and economic value" (Elyachar 2010; 2012). In fact, to navigate the market and effect material and economic value transformations, scrap dealers needed to acquire highly prized and to some extent protected knowledge of supply and demand, in the form of names and phone numbers and knowing sellers and buyers personally.

Yet, given the essential role such skills played to the scrap dealers, limiting their circulation was also important to keep one's position in the value chain valuable and to keep the value chain from

collapsing. Herzfeld (2003) describes a similar state of affairs among artisans in Crete. The marginality of artisans and the devaluation of their skills, as well as the close competition, leads to a valorisation of secrecy. In Kabadabad, scrap dealers and workers in the e-waste market claimed knowledge, but also emphasised secretiveness of the trade and demonstrated various limits to knowledge. While everyone claimed "to have" abundant knowledge, evidence to the contrary with insistence that information was hard to come by in the e-waste market created an air of scarcity in the market. A situation that is similar to Hertzfeld's (2003) description of visible secrecy, where there was an emphasis on demonstrating secrecy for all to see. Being a man and an artisan in Crete meant holding your tongue and not letting anyone in on the trade secrets, not even apprentices, who in turn had to learn by stealth. In Kabadabad, secrecy similarly formed a boundary of entry into the business, but once a man would become part of the "phatic communion" (Elyachar citing Malinowski 2010), the social control over knowledge was actually relatively weak. This is why claims to secrecy and small acts of limiting the flow of information were part of the labour of e-waste trading. Such acts effected a high degree of specialisation of labour on an urban shop floor. On this dispersed shop floor each actor's tasks were designated and delineated by their limited means and knowledge, with only some attaining the high position of "being able to buy anything" as Shaheed and Samir's eldest brother claimed (discussed in Chapter 1). The fact that the younger brothers did not deal in everything shows that knowledge did not circulate evenly even within the family. What I found was that the control of differential access to knowledge, material, economic and social, in fact operates the e-waste value chain and gives the market its particular shape. Besides producing a city-wide division of labour, the value chain also served as a chain of interconnected knowledges, with no one having complete grip on it, which in a way obscured more than it illuminated (Appadurai 1986). The demonstration of secrecy also made it hard for me as a researcher to follow the circulation of goods and pollution beyond the Sahih Kaam's scrap dealers. Although I suspect that, if I really insisted, this would not have been impossible, yet, I found it interesting to a certain extent to remain within the boundaries they had delineated for me.

This exclusive and specialist knowledge, however, was not the domain of hired labour who work in the workshops of the *kabadiwallas*. Hired labour and saving on it by partnering with family members is central to unmaking objects into secondary materials that can be fed back into production. Hired labour also requires the kind of material familiarity and skills that Sanchez described (Sanchez 2020). Where the volumes justified it, some *kabadiwallas* hired young boys or men with the practical skills but without the liquidity that was required for making large purchases. Though everyone I spoke to insisted on not employing child labour, Mahmood's labour hired to assemble CPUs for compliance were school-age teenage boys. There was a sense, however, that

once the young boys would save up the money, they would also get the chance to putting their knowledge to more productive labour and start trading themselves. In fact, Mahmood had started out in the same way working for others, then he started dealing small, before he became a large volume aggregator for Sahih Kaam. Thus, the "knowledge" of e-waste also meant being able to pay for larger loads.

After Shaheed had come back from the mosque, he and Jaleel continued to banter while they combined their resources to try to sell the 850 kgs of printed circuit boards. They went through the numbers saved in Shaheed's phone, trying to remember who might be interested in the kind of boards offered by Jaleel. Their effectiveness was greatly limited, as Shaheed lost his phone every once in a while, and all the phone numbers with it. The numbers that went through appeared to belong to *kabadiwallas* who had moved on from trading in boards. The way they put their heads together came as a great contrast to the urge to keep Hassan ignorant and gives an idea of how knowledge was also shared on occasions when the act did not immediately threaten one's deals. As the case of the 6000 keyboards shows, when it suited Shaheed, he also formed a partnership with Hassan and the two shared whatever they had if it was beneficial to make a deal. Which is also how Hassan came to sell to Sahih Kaam, suggesting the temporary nature of partnerships and the different temporalities of knowledge acquisition.

Ultimately, I am interested in how the various knowledges are used for different kinds of value conversions, economic and ethical, and how claims to knowledge are mobilised as part of "tournaments of value" (Appadurai 1986). Making claims to having knowledge in the e-waste market appear to have much to do with what Lambek calls after Graeber "the tension between display and the potency of concealment" (Lambek 2008). What matters here is that the claims to knowledge appear as assertions of one's own value in the market related to their capacity for value transformation (Munn 1986). To maintain one's value by having exclusive knowledge and keep that knowledge valuable, there is also a need to limit its spread. Although the emphasis is on making money, the alliances are made or broken in light of what facilitates everyday trade, but the value transformations also valorise those who effect them. Beyond supply and demand, knowing buyers and sellers and the right ratio chemicals to recover gold in the face of global prices of metals also effects the self-worth of the scrap worker.

I evaluated what the scrap dealers mean when they claim to have knowledge and then traced how this knowledge is sought out and appropriated by Sahih Kaam to use it for their own ends of value conversions.

The work of revaluation

This chapter explored the *kabadiwallas*' claims to knowledge presenting it as a form of value, which could be acquired through stealth and relations. Knowledge means the capacity to source *maal* and find buyers for it but, at the same time, it also means knowing how to transform the materiality of e-waste for buyers. Therefore, to effect value transformations in the Malik value chain *kabadiwallas* require material value and social skills to work the network. This knowledge, then, is guarded from potential competitors who, if they would get wind of a new buyer or available loads, could lower one's chances of making a deal.

While scrap work in anthropological account is often held up as work that requires skill and knowledge (Gill 2009; O'Hare 2022; Sanchez 2020), my ethnographic material about withholding knowledge and the instances of failure in conversion point to the importance of exploring the limits of knowledge. The limits to knowledge, however, inasmuch as they are about controlling and gaining access, differ qualitatively from ignorance. The question should be considered in light of the discussion on transformation as the basis of the creation of value (Sanchez 2020) and the circulation of knowledge through commodity exchange (Appadurai 1986).

The focus on the work of revaluation makes it possible to bring workers from wildly differing backgrounds and in radically differing job roles within the same frame, going against the logic of caste and class distinctions in the city. At the same time, it also complicates the picture painted in the previous chapter about odd alliances. The discussion in this chapter foregrounds the competitive aspects of the exchange relation between Sahih Kaam and the *kabadiwallas*. Knowledge flows through exchange even when the parties take care to limit its circulation. Ultimately, this leads to the extraction of not only e-waste but of its "knowledge," as it is defined in the social context of Kabadabad.

Chapter 7: Connecting knowledge and selling responsibility

Sahih Kaam understood itself to be the most knowledgeable actor in the e-waste ecosystem, something that gave them the unique capacity to intervene on a systemic level and change the way e-waste was recycled. Thus, when it came to Sahih Kaam, knowledge meant something radically different than in the hands of the *kabadiwallas*. It included awareness of responsibility—e-waste's multiplicity as a hazard (chapter two) and a resource (chapter one). It meant knowing the environmental standards for the proper way of recycling (chapter 3) as well as the right connections (chapter 4) to be made to stabilise the company's expertise in effecting value transformations. When it came to the PRO, expertise meant the ability to work across the different value scales and, through that, to produce value that included economic profits but went beyond. This chapter examines the work of waste at the PRO, extending the concept of waste work beyond the most marginalised waste workers who are usually the protagonists of anthropological studies.

The idiom of transformative action, compounded with claims to the requisite material, social and economic knowledge, highlights three specific points. The first is to know that scrap work is not simply about the knowledge of materials and material transformations, and their potential in the light of the value chain. The second is that, in the face of general devaluation, it is important to emphasise that scrap workers being knowledgeable and skilled, limiting the circulation of their knowledge sustains the value chain and the value transformations that happen through it (or, perhaps, this limitation is the very condition of the expansion of the value chain). The third instance highlighted by my material is that scrap workers are not the only ones who labour on transforming value in the scrap chain. With an attention to the work of other actors, the problem of ethics and its conflicts become visible. The three highlighted issues point towards Bear's (2016) taxonomy of "the labour in/of time." She urges anthropologists not to separate but consider the interplay of *techne* (techniques), *episteme* (knowledge) and *phronesis* (ethics) of time. The present chapter explores, and expands on, the way in which the different timescapes of Kabadabad market and the market of responsibility come together and are pitted against each other. In this way, this chapter continues to explore the theme of competition but traces across the different scales of markets, to nuance the picture of cooperation painted so far in the relationship between aggregators and Sahih Kaam. This requires a rethinking of labour (Harvey and Krohn-Hansen 2018) and of the question of who counts as a waste worker (Doherty and Brown 2019). I argue that transformation of waste into resource is not the sole responsibility of those at the margins of society and the most precariously employed.

Modern-day *kabadiwallas*

Early on into my fieldwork on one occasion Santosh, a young man working on logistics, and I were returning by metro from the Sahih Kaam warehouse to the office in Gurugram. He had gone to the warehouse to configure the automation process. As it turned out, automation was an important step in making it easier to keep track of inward and outward flows of materials, although to my consternation it did not do much to relieve the burden of warehouse workers who carried sacks of e-waste on their back from the incoming truck to pile, on arrival, and back when it came to loading the now recycling-plant–bound trucks.

Santosh had studied logistics for his higher education in an institute in North India. He spoke English with the ease of the Delhi metropolitan youth, which distinguished him from his other male colleagues in the operations team and allowed him to be at ease among the mostly female members of the business development and awareness team, who had returned from abroad (see Chapter One). As I quizzed him about how he ended up working in Sahih Kaam and what his goals were, he told me that he broke the family trend by not becoming a doctor. Having worked at Sahih Kaam for over a year, he expressed the dilemma whether to move to Canada next year to study further, or stay around since the company's growth also provided him with a chance for personal growth. He found the present job at Sahih Kaam as he was looking for a job, "any job." In this, he was more like others in the operations team who, unlike those in the business development (BD in short) and awareness teams, did not have any prior design of "working for the environment." His plans to move to Canada for a masters in logistics to further his education made him more akin to those that had gone abroad and come back to work in Sahih Kaam, inasmuch as Santosh's plans were in line with the aspirations of middle-class English-speaking Delhi youth.

On the occasion we travelled to the north of the city and back to office together, on the road he confided to me that he found trips to the warehouse very exciting and stimulating, even though a little less "hygienic" than his office work. The trips allowed him, along with the others who worked in the office, to keep in touch with their colleagues working out "in the field," who would usually receive their instructions through the phone. Yet, on visits like this Santosh got a chance not only to plan and instruct the implementation of processes from afar, but to see how processes designed in office worked out on the ground. "You can make up processes all you want, but if you don't go and sit with them, then you don't appreciate their hardship. They'll resist you and what you want them to do," he reasoned. At the same time, such trips also provided an occasion to meet the aggregators, or exchange news about them with the warehouse staff who were in contact with the

kabadiwallas on a daily basis. Thus, such trips were essential for those working on the other side of town in the office, to gain knowledge of what was going on in the warehouse. And since it was adjacent to the e-waste market and aggregators would turn up regularly, these excursions would also lead to regular updates about the market. This allowed them, as Santosh suggested, to finetune operations in the office.

Having fiddled with the installation of the barcoding machine, the technology supporting the automation of the warehouse, the visit was over, and it was time to return to office. We first took an auto (three-wheeler taxi), then sat on the metro for a long time. Just before the conversation was about to dry up after having spent a long day together, Santosh met an old schoolmate. The two young men sized each other up in the manner of such encounters the world over, and, having exchanged pleasantries, offered and asked for details of work and family status. The other young man was married with a stable job in the banking sector, at which Santosh wondered, for he used to play around, he used to be a *haramzada*, which means literally bastard, but here it stands in for a stronger word for naughty. Having no marriage to boast of, Santosh talked about his job at Sahih Kaam. "We are basically high-tech *kabadiwallas*. What Satkar, the founder of the startup, is doing, he is trying to enforce European rules in e-waste recycling in India, but the context is not the same."

The boast occasioned by the situation of two young men comparing careers points to the complex web of judgements on work in contemporary India. Santosh's ways of reflecting on his own work and measuring it against a more established ex-classmate shows how the young, well-educated men and women took pride in doing useful work at Sahih Kaam. This pride allowed them a specific position of self-worth, from which to engage in "tournaments of value" (Appadurai 1986). It points to Susanna Narotzky's point that to rethink labour we need to attend to how "the value of work is very centrally its social aspect"—it has to do with what society values (Narotzky 2018, 40). A large percentage of the employees working in office were unmarried, young women and men having recently graduated either in prestigious or less prestigious higher-education institutions in India or abroad. They left their institutions with a commitment to do jobs that were useful for the environment and Sahih Kaam provided a great entry to the environmental sphere.

Similarly to how Santosh characterised his work to his old classmate, both the Sahih Kaam founder and his employees liked to talk of themselves as *kabadiwallas*. However, they used the distinguishing adjective "high-tech" to firmly set their work apart from the way *kabadiwallas* worked in Kabadabad. This also positioned them among the demographic whose job it was to transform waste to resources, from informal sector waste to responsibility in the framework of EPR. In the

process they reiterated the distinction between themselves, who fulfilled EPR and "worked on implementing European rules" and "cleaning up the system," from those "in the informal sector" who merely traded in e-waste. This had wider implications in terms of class and caste effects of labour, making distinctions within "classes of labour" (Parry 2020). Parry argues that "class now trumps caste as the dominant axis of inequality" (Parry 2020, 4). Yet, his characterisation is limited by the fact that his concern is with the labour force of a state-funded steel factory. The work of waste both in Kabadabad market and the social startup requires an ethnographic attention to labour in spaces other than the industrial heartlands and to examine the different "affective forces that colour contemporary experiences of labour" (Harvey and Krohn-Hansen 2018, 12). For PRO employees the work with waste became a badge of honour, a meaningful labour, and it did not devalue their labour and bodies as I have shown it did for the *kabadiwallas*.

To drive this contradiction home, the founder Satkar told me in our first meeting that no one grows up dreaming to work with waste. And yet, Sahih Kaam provided a space where the aspirations for respectable jobs and an impactful life of young people of upper-caste, middle-class backgrounds could be fulfilled. This also reflects the shift towards the trend that young people look for green and environmental jobs as spheres in which they can do something worthwhile. Waste work was especially attractive, because it provided a contrast to "bullshit jobs" (Graeber 2019). The frustration with such bullshit jobs is compounded with the environmental impact of many a corporate job that are available as avenues of career progression for highly educated young people. At the same time, reaching these goals requires a specialist education and a set of knowledges acquired as part of the job experience. All of this meant that the adjective "high-tech" prefixed to the word *kabadiwalla* also indexed a claim to a whole different set of knowledges than what *kabadiwallas* operated with. This was waste work but transformed beyond recognition.

PRO workers are more akin to figures of the "knockers-through" (Thompson 2017), the young creatives, who reclaimed decaying housing in devalued neighbourhoods in 1970s London. Redoing houses and knocking through walls, their labour led to the revaluation and gentrification of entire areas. My aim is to enquire into the kind of knowledge work required for the revaluation of e-waste into commodifiable responsibility. Like the "knockers-through" in London, Sahih Kaam employees were not yet established professionally but were growing into workforce at a time of crisis. In the Delhi of 2019, my interlocutors at the PRO were driven by a growing awareness of the environmental crisis as the greatest challenge of the times. In their attempt at turning the hellscapes of e-waste to responsible recycling channels, the young, middle-class PRO employees engaged in a form of time tricking (Bear 2016) aimed at returning a sense of control and agency

over environmental degradation while also building a career.[24] The key to this was to learn to revalue e-waste into responsibility. In this way, Sahih Kaam employees put the knowledge acquired from *kabadiwallas* through the associations with producer brands into making business out of fulfilling EPR on behalf of producer brands. This required a mastery akin to the mastery of Shaheed inasmuch as it meant suturing together multiple value scales. It required a material knowledge of e-waste and of the workings of the informal e-waste market, its negative environmental effects, as well as the ways of the corporate world. Mastery in this way meant to work across the short-term timescapes of the e-waste market and the long-term ones of responsibility (Bear 2016) and "to modulate from one mode of value production to another" (Elyachar 2005).

Seeking "knowledge" at the PRO

Sahih Kaam's claim to expertise hinged on the knowledge gained through the exchange and close connections established with aggregators in the informal market. In a way, this could be interpreted as continuing the kind of knowledge practices explained in the previous chapter. Yet, this knowledge came to be valuable in the context of the different scales of value—their ethics of doing work and doing it right, and in comparison with other actors in the e-waste ecosystem who did not move material and only did paper trading. This gave Sahih Kaam the self-perception of having an ear to the ground—a connection to the place where e-waste was exchanged. At the same time, this also rested on a tacit acknowledgment of the informal sector myth that information on where to buy and where to sell was hard to come by. The connection to the market was hard won and, therefore, provided exclusive knowledge.

As mentioned in the previous chapter, Sahih Kaam did not have an easy time when they first came to the market to buy e-waste, given the way in which knowledge circulates and is withheld in Kabadabad. Employees often recounted the difficult first months of the company, when no *kabadiwalla* wanted to sell to them. Satishji had to roam the scrap market for six months before he could make the first deal. He also set up a shop to serve as a base for his presence in the market and he used to live close by with his family, too, in one of the neighbouring areas that were identified as suitable for "VIPs" or those higher than *kabadiwallas* in the social hierarchy. By the time of my fieldwork, there were quite a few established suppliers of e-waste in Delhi, which gave a sense of pride to employees across the entire company hierarchy. When talking of his time in

[24] There was no less of a crisis in employment. In 2018 the media carried stories such as the *Firstpost* article where a peon job in Uttar Pradesh had 93,000 applicants, among them 3,700 PhD graduates (FP Staff 2018).

"the market," Satishji would say "I roamed the market wearing shirts and pants like them [*unke jaise shirt pant pehenke* market *mein ghumta tha*]." The "them" referred to the *kabadiwallas* and the account every time reminded me of the ethnographic method, for Satishji explained his success on blending in and sticking around long enough to be recognised.

The expression "market *jaana aur* market *mein ghumna* [to go to the market and to roam around in the market]," expressed the kind of work that Shaheed did when looking for new sources of scrap. This activity was contrasted to his brother Samir's work who, with both legs paralysed by polio, usually squatted on the warehouse floor breaking CD-ROM players or unscrewing the small screws that held the players together. Incidentally the wives and sisters also talked of my work in those terms, *market ghumna*, with a barely concealed snigger, since for a woman it was an odd occupation (or even to have an occupation at all). Another person whose work consisted of roaming the market was Manish, the Sahih Kaam employee stationed at the warehouse tasked with sourcing e-waste and supervising loading-unloading and documentation for the company. Once Satishji was moved permanently to the office, Manish was left to provide the crucial link between aggregators and company. In the beginning, I found my way around the market by accompanying Manish as he did his rounds. Later, when we parted ways, I would often meet him, even on his off days, lounging in the warehouse of Mahmood.

Manish performed "phatic labour" (Elyachar 2010), for the benefit of Sahih Kaam by cultivating close friendship with some of the aggregators. In the process, he gained a good knowledge of the market, learning about trends, rumours, price shifts and new consignments. While he lounged around with Mahmood and Parvez, he would also discuss the details of the business, how much *maal* should be provided, when would it be loaded, how much it costed. "*Yaar* [friend], you really need to deliver that *maal*." This was not my pre-fieldwork idea about the market encounter between Sahih Kaam buyers and scrap dealers, where I imagined that the two parties would face each other in an impersonal encounter and would engage in a demonstrative bargaining exchange. The unsaid concern was that Manish had gone a bit too native, he entreated me that I should not tell anyone in office that we celebrated birthdays together. When Sahih Kaam began to drive their prices down, Mr Kakkar sent out others to corroborate the information Manish provided on the established market prices (detailed in chapter one). He called me into office to ask me to keep my eyes out for particular qualities of products and their prices. I found out later that another employee entirely unfamiliar with the market was given a similar brief. When Manish found this out, he exclaimed, "I had told them these were the prices, but they don't trust me!"

Whether he had gone native or not, Manish created the connection between the dingy low structure of Shaheed's warehouse among the towering buildings and the office in the city's financial and corporate district. In fact, following the 2016 legislation, the e-waste market gave way to the corporate world as the site of revaluing e-waste. Through having constant presence in Kabadabad, the PRO entered into the market, established relationships, gained its knowledge. Even if partial, knowledge came to be extracted alongside e-waste from the informal market to the formal one. This reminds of the Polanyian (1944) concept of embeddedness of economic activity in social institutions, which then becomes subject to the abstracting forces of the new market in responsibility of a more recent, conscious design. Manish performed the dual duty to embed himself in the market, but also became the agent of extraction in the urban mine. Apart from Manish, Amit's job was also to do the rounds, but he would do that across the country, visiting aggregators and recruiting new ones. He explained that his job was to pat the scrap dealers on the back and show them a friendly face. For as part of the aspirations detailed in the previous chapter, a part of the charm of selling to Sahih Kaam was in associating with those higher up in the social and market hierarchy.

This chapter also explores the labour that effects the shift between e-waste as a commodity in exchange and the commoditization of environmental responsibility for electronics brands. It would be easy to understand the process of extraction of e-waste and knowledge from Kabadabad's informal market as dispossession (Gidwani 2013; Reddy 2015; Gidwani and Corwin 2017). Here, the extraction becomes the material foundation for making profits out of environmental responsibility, a form of primitive accumulation through the enclosure of the commons (Harvey 2003; O'Hare 2022). However, based on the previous chapter's exploration of the circulation and withholding of knowledge, the idea of a commons does not quite describe the situation. The process is reminiscent of Elyachar's (2005) argument about the institution of new markets through microcredit for micro entrepreneurs to replace the already existing notions of markets among craftsmen, which mainly benefitted the NGOs and global financial institutions involved. Instead of empowering artisans, the World Bank-funded project in Cairo in the 1990s sought to acquire the social networks that the poor relied on to make it the basis of new economic value.

Shaheed's disappointment, invoked at the end of chapter 5, at the slow influx of payments and the slow shift in Sahih Kaam's market engagements to reduce prices, foregrounds the need to pay attention to the temporalities (Bear 2016) of the various types of waste labour. Leaving it at the argument of dispossession would ignore the effective way in which the Malik value chain resists appropriation through the patterns of circulating and withholding knowledge. This is what ensures

the informal sector's continuing importance in the e-waste sector. At the same time, despite the characterisation of *kabadiwallas* as ignorant and uneducated, Sahih Kaam found that their aggregators were, in fact, repositories of some coveted knowledge. Still, declaring the process as dispossession would also be dismissive of Sahih Kaam's seriousness when it came to fulfilling environmental responsibility and ethics of the right kind of work (*sahih kaam*). Yet, the channels to extract e-waste did create the channels to extract "knowledge," contributing to the development of emergent systems that, in the end, were aimed at closing down the market.

Sahih Kaam's mastery and its limits

The claim to "knowledge" at the first and most concrete level referred to an ethnographic knowledge of the e-waste market in Kabadabad, in continuity with the aggregators' claims. Yet, on the lips of Sahih Kaam's employees, the goings on in the physical space of the market signified something different. What they claimed they knew was that other PROs who competed for the same contracts by the electronics producer brands were not buying up e-waste in the same quantities as Sahih Kaam was. The rare encounter in the market with other PROs was proof that the compliance work done by others would not be as meticulously matched to physical movements of e-waste as environmental responsibility required. In chapter four I recounted one of Manish's monthly trips to the office, when he would deposit the physical copies of bills, delivery letters and detail news of what is going on "in the market". On these occasions, Manish would bring stories such as the one about the other PRO team which loaded up a car, took pictures for PoE (proof of execution), made the car go round the block and brought its load back to the same warehouse where it was unloaded again. From the accounts of aggregators, Sahih Kaam also learned that time to time other companies approached *kabadiwallas* to provide documents in fulfilment of compliance without matching material flows of scrap, to make the process cheaper.

For e-waste processing in India, as chapter four demonstrated, lags behind in the transition to environmentally responsible practices. The PRO's hard work to break the vicious circles of e-waste falters on the withholding of knowledge by another actor in the ecosystem—registered recyclers. Thus, the PRO carefully audits and vets the recyclers before "onboarding." Which means to "disrupt the status quo," as one of Sahih Kaam's early promotion materials had declared. To effect the disruption, the goal that the company had sat itself early on, it was not enough to formalise e-waste, complete with documentation, weighing slips, invoices, PoEs, and traceable bank transfers. The real difference is made by selling to registered recyclers. However, this was the great bottleneck in the value chain of formalised e-waste. Sahih Kaam, to live up to their name of doing the right

work, began to work on their relations with recyclers to make them prove that the material was indeed processed once it entered the premises.

Auditing recycling plants was Amit's job, who got up from his office desk every once in a while to go on recycler visits unless recyclers came to seek him out. He teased me the whole year of my fieldwork promising to take me along whenever he went to "onboard" a new one, but when it came right down to it, he always backed out. "Onboarding" was a delicate matter and my presence, he probably felt, would upset the balance between trust and the imperative to make business. I finally got to attend a meeting between him and Ashok, a representative of a recycler who came to offer his company's services at the Sahih Kaam office. Ashok had been recently hired by a relatively new German-backed company with a good reputation, connected to an established refurbishing business that has been renting IT equipment for twenty years from the items recovered and refurbished from waste. This business model bridged the issue of interval scales of value between working order parts selling for more and those scrapped for material recovery selling for less.

Amit led the discussion detailing Sahih Kaam's conditions and concerns with the requirements for TSDF (treatment, storage, and disposal facilities), certificate of destruction, data wiping, etc. Ashok was willing to comply, he offered the plant's licenced capacities that had remained of the financial year at Sahih Kaam's disposal. Amit guardedly accepted, befitting a true businessman, and gave an estimation of the expected time of the "onboarding" process and the first date at which the first load for trial could be sent through. This was the point when Ashok got around to raising his own concerns, apologising beforehand: "If you don't mind me saying, Sahih Kaam does not have a good reputation in terms of the quality of material that reaches recyclers." To which Amit responded, "We are working to end the waste problem, *humko e-waste khatam karni hai* [We want to finish e-waste]. We can't be picky about the material we send." And with this evocation of the long-term ethics of e-waste work, he trumped the economic calculations of the recycling plant, if only temporarily. While recycling plants were buyers of waste, knowing them could be characterised as knowing demand. Yet, recyclers remained an elusive part of the responsible value chain leaving Sahih Kaam guessing whether they did any recycling or leaked e-waste back into the scrap market.

The distinction between the right kind of recycling and the wrong one, between letting economic values dominate over environmentally responsible practices or vice versa, is comparable to the "enclaving of taste" (Appadurai 1986). Knowledge becomes value by enclaving and limiting its free flow. In the political economy of taste, some objects become exclusively accessible for those

with taste, controlled by those at the higher echelons of society to counter the widening access through merchants and middlemen. At one time, in the early days of the publicisation of the e-waste issue, enclaving and the political economy of taste was directed to the consumption of electronics and maintaining the digital divide. The wealthy half of the globe were the ones who could afford to operate phones, computers, and consumer electronics, while people in India and China were destined to pick up the scrap after them. However, due to the transformation of consumption patterns in the past twenty years, with the programmatic extension of consumption to ever widening populations, the smartphones had played a crucial role and electronics had become truly ubiquitous. Today *kabadiwallas* are as likely to have the latest iPhone as any of my Sahih Kaam interlocutors, or perhaps even more likely. Thus, e-waste is no longer the symbol of global inequalities of consumption. However, the modes and technologies of waste processing are fast becoming the subject of such hierarchising of values. The wholesale devaluation of informal sector labour (Gidwani and Corwin 2017; Corwin 2020) operates on the level of enclaving certain kinds of knowledge as more valuable than others. This, however, does not mean that the *kabadiwalla* "knowledge" of the Maliks is not crucial for operations. At the same time, through withholding and circulating knowledge within the Malik value chain Maliks also had some power over enclaving their mastery over material and market transformations.

Sahih Kaam, however, through the close relations with *kabadiwallas* and the "phatic labour" of those at the lower echelons of company hierarchy, gained access to the specialist technical and material knowledge of dismantling. This was no small matter, as rumours were spreading about a newly established recycling plant, Vantage Point, soon after Amit "onboarded" it that their hired labour was very inept at taking items apart. This meant that while labour in Kabadabad would take a few hours taking apart a sack full of mice, the recycling plant labour would struggle with the same task for a day, making it into a loss-making enterprise. The owners did not have any informal sector labour or dismantling expertise, unlike Ashok's recycling plant did from refurbishing. When it came to Sahih Kaam establishing their new dismantling plant, they found ways to inquire about factions and hand-held tools from their aggregators. I was witness to a time when Amit asked after and picked up the factions that result from breaking apart CD-ROM players at Shaheed's warehouse. Another time, Manish told Shaheed about where to source the screwdriver that is used to take things apart. In each of these occasions, I felt the tension of "they will take my knowledge and get rid of me," the fear voiced by Shaheed at the end of chapter three in a conversation about *kabadiwalla* honesty. A process of dispossession is certainly part of the story of extraction as can be seen from Shaheed's unease at Amit's interest in the factions that come out of CD-ROMs, or

Manish asking for the screwdriver. Yet, this needs to be examined in the frame of Sahih Kaam's longterm goal of changing the way e-waste is recycled according to environmental standards.

In this way, the long-term of responsibility is one way of enclaving knowledge in e-waste recycling. The attribution of responsibility and the moral weight it carries was designed as an integral element to the concept of Extended Producer Responsibility. It is noteworthy that Thomas Lindhqvist, "the father of EPR", chose the word responsibility over other options, such as liability, obligation, and suchlike concepts (as detailed in the ethnographic vignette that begins this thesis). He emphasised that words are very important, and he preferred "responsibility" over "liability" or "polluter pays," because he wanted to avoid the negative connotations of these wordings. Responsibility was a better option as he expected that no one would say "No, I'm not taking responsibility," as he explained, not even electronics producer brands. This aligns with Laidlaw's (2014) definition of responsibility meaning the "judgements about causal contribution and ethical judgements." At the same time, as this thesis had shown, what responsibility meant in the e-waste recycling sector in India had to be worked out in practice, working through the different value scales of materiality, use value, ethical values, and labour. In this way, the labour of responsible e-waste recycling required the "responsivity" which Chua et al. (2021) define "as an ethic for working across, through, and with an Anthropocenic uncommons." By this, they mean that, despite the planetary framing of a common responsibility, local social and material relations produce contrasting claims and multiple obligations. To fulfil environmental responsibility, actors, such as Sahih Kaam, must work and create commensurability across geographic scales, informal market practices, and corporate norms of business, and multiple material, time and value scales that pattern e-waste's materiality.

As Lambek (2008) points out, it is important to pay attention in the face of such exercises to the incommensurability between the different value scales of ethics and economic value and the dynamics that an effort of commensurating them produces. This is better described through describing e-waste as a boundary object (Star 2010), to include the sense of cooperation across social worlds. At the same time, this also points towards the idea that the labour of responsible e-waste recycling requires the working together across the different "interpretive flexibility" of e-waste. In Kockelman's (2016) terms, commensurating the incommensurable requires creating equivalence or a path between "relatively different variables [that] can (seem to) have relatively similar values" (157). This requires "immaterial labour," which means the collective action and attention of a group of people on producing values that can have a price, bought or sold, but have an impermanence that sets them apart from more productive forms of labour. Environmentally responsible e-waste recycling requires exactly such an "immaterial form" of labour, where the value

produced is not in the products produced, but in the manner of how e-waste is made to disappear. "We want to finish e-waste." At the same time, despite the immateriality of labour, it has very material effects.

Startup culture and "yeh robot zindagi [this robot life]"

Santosh has been the ideal person to kickstart a discussion on how knowledge operated within Sahih Kaam. He straddled the cultural and class divide that ran through the workforce in the office. On the one hand, Santosh was part of the operations team that was responsible for what I, to myself, termed "heavy lifting": the job of sourcing e-waste from the market, handling payments, organising logistics, filling forms for GST, and auditing and "onboarding" recycling plants. The team consisted of 6-8 male employees who sat at one table at the far end of the office. The men spoke chiefly Hindi among themselves. Although they sat in the same office, they seemed to be inhabiting a different world from the mainly female team of BD and awareness.

At first, I found them harder to approach and their operations remained mysterious to me. On the few occasions when I got to talk to some of them over cigarette breaks in the back garden of the office building, I learned snippets of their work. How Amit is the one responsible for keeping 400 trucks moving across India at all times. How Satishji, always mentioned with the honorific suffix "ji" appended to his name, was responsible for finding and enrolling the first scrap dealers to buy e-waste from them. It struck me when I heard Amit complaining of "*yeh* robot *zindagi* [this robot life]" in which he woke up, went to work, stayed till the evening, slept and in the morning the routine started all over again. As his family stayed back "*gao mein* [in the village]," he lived the life of a bachelor, only frequent after-work drinks and weekend visits to his family punctuating the decried routine. Yet, Amit, just like most of the employees who worked at Sahih Kaam at the time, enjoyed the challenge of having been part of setting up the company from the beginning. When, towards the end of my fieldwork year, I got to work with him on setting up a recycling plant, he explained to me that, had he stopped having new things to set up, he would find it boring and would have to move on. Because of his problem-solving skills, Amit became one of the most important employees of the company by the end of my fieldwork year. He was regularly sent on trips around the country to visit recyclers and scrap dealers. His job was, as he said, to pat "aggregators" on their backs and ask how things were going, so that aggregators would feel like they matter. At the same time, he also took the opportunity on these rounds to scope out new aggregators and find out new markets from where Sahih Kaam could source its wastes.

Even more than knowing what the right thing to do was, the connecting work that Sahih Kaam did between different value scales also benefitted from the founder's close connections with electronics producer brands. A team of women with higher education in environmental studies, along with Daredevil, an IIT graduate in civil engineering, manned the BD and producer teams. The former's task was to acquire and later to keep corporate clients. Many early clients came through the founder's professional network that he gained while working in environmental compliance in big companies. Yet, the boundaries between these teams were blurrier than between the operations and awareness teams, since the same background in environmental studies prepared for each job. Navita's experience of recruitment tells of the fluidity of job roles with that background,

> [F]or the first three-four months, I was doing all sorts of things. I was initially part of the producer team, but I was preparing databases, I was doing some market intelligence work and, then, I was looking after bulk consumer returns, involved in some HR jobs, hirings, preparing job descriptions, all those things. Then, after one team member had left us in September, a lot of the responsibilities were delegated to the team. So, then, I went on to account management, I was given four accounts. Account management involves everything from sharing all the compliance-related documents with the client to ensuring that they are happy, satisfied, to ensuring that all their compliances are met, and building a relationship with them.

However, the tasks required more than an environmental sciences degree. Employees often emphasised that they had to learn how to navigate the corporate language and world. At the same time, they also found the corporate world unsatisfactory, and to be at odds with what they knew to be good for the environment.

The start-up took on young people with great education record but no, or little, job experience, with an understanding that they would learn on the job. This was no sacrifice on the startup's side since job roles were rather undefined and fluid, everyone chipping in to work on the most urgent tasks. This was something that employees often complained about, along with the long hours they had to work, "This is a startup," said a guy who chose Daredevil as his pseudonym, reflecting the Marvel craze that was washing over the office at the time,

> *Job acchi hai, matlab kafi kuch seekhne ko mila tha* ["The job is good, that is, I got to learn quite a lot"]. But the thing is it's a start-up, start-up in terms of the work culture. Like you should come at nine. Or when I joined here, when I came here before that, I had a talk with HR and she told me that the job is from 9 to 5:30. Or you can come between 9:30 to 6, but

> when I came, I saw people working till 8, which I think *ya to pehle* clear *karna chahiye ki yaar hum* extend *bhi kar sakte hai* [either you have to make clear from the start that we can extend working hours]. *Ya phir us hisab se* [or then accordingly] you should give salary. If you are telling them to work more, then, you should pay your employees, otherwise…

Eager to learn more about his job satisfaction, I cut Daredevil short in the interview, but the word "otherwise" hangs looming after the beginning of the discussion, in which he explained about the new government job for which he was leaving Sahih Kaam. The issue of salary was a painful subject to the employees, otherwise motivated by the good that they were able to contribute through their labour.

The complaint about low salaries resounded in the office. One day, as was customary and regular pastime in the lunchtime break, the colleagues were teasing Lata. This time it was over her loud complaints that she did not feel like doing any work. Some suggested that she will have to get on with it because this was how she earned money. To which Bhaveeka, an old friend of Lata's and schoolmate from their masters' years in Europe, declared, "If we wanted to earn money, we wouldn't be working here." The off-hand comment captured the foundations on which the start-up rested: an educated workforce contracted at lower rates in return for meaningful work. For the job offer at Sahih Kaam, the positive ethics of working for the environment as well as learning on the job were perks calculated into the deal.

Although hierarchies of value in Indian society placed the status of work at the startup much above the work of the *kabadiwallas*, it was unclear which one of them had a better or a worse deal. Both had exhibited pride in the knowledge acquired through their labour and the transformations they could effect. However, Sahih Kaam employees appeared to have a much worse work/life balance, which they had to justify by arguing that their work was worthwhile in the long run, because they worked in the most important sector—formalising waste recycling and contributing to cleaning up the world.

Conclusion

Throughout the year of my fieldwork, the company had a large turnover of employees. Around the end of my fieldwork year, two years after beginning operations, the PRO had swapped approximately two thirds of its workforce. This meant losing many of those who took part in setting up the company and who moved on to other, better paid, jobs with more established work routines. Those who were leaving were feeling guilty and were sure that their leaving hit Sahih Kaam very hard, assuming that their labour in a highly volatile and non-routinized task distribution

would be irreplaceable. However, it appeared that the environmental studies background that seemed to be so important at the outset of establishing the company, did not seem to be such an important consideration anymore. Interestingly, many of those who left took better paid jobs, eventually with companies even more firmly established in the corporate sector. At the same time, the new workforce was more from business and management backgrounds, indicating that the company was ready to move on from commensurating the incommensurable and getting down to business-as-usual.

In this seventh chapter, second of the two last two chapters exploring the circulation of knowledge in e-waste work, I traced how Sahih Kaam acquires knowledge of supply and demand in the scrap market but uses it to satisfy a demand in the market of responsible recycling. The demand in responsible recycling is fuelled by recyclers' potential for the recovery of raw materials and by producer brands. The latter are mandated by law to fulfil their ethical responsibility of disposing a certain percentage of post-consumption waste either individually or collectively through a PRO. Exploring the work that Sahih Kaam and its employees do, I have conducted an inquiry into the ways through which the virtue of responsibility becomes a commoditized service and into the types of knowledges, which facilitate this revaluation. In this chapter, I supplied the figure of the PRO worker and their work ethics to complete the picture of those working in the e-waste sector and the kind of knowledges required to effect the revaluation of e-waste into responsibility.

Gaining partial knowledge of supply in the e-waste market allowed Sahih Kaam to start to buy waste in bulk, an exchange that made possible the honest, responsible fulfilment of EPR by matching material flows to the paper trail. Yet, along such snippets of crucial information, some of the patterns, knowledge as value, and attempts to restrict its circulation, also start to creep into how Sahih Kaam does business. I found that the demonstrative air of secrecy crept into the Gurugram based office, too, making it harder for me to understand what was going on. It was not that I was stopped from learning about the business, but there was a show of much of it being delicate or secret knowledge, even if eventually I found out about it anyway. The way secrecy crept into the office connects the knowledge required to make deals in the local e-waste market in Shaheed's warehouse, invoked at the beginning of the previous chapter, and Sahih Kaam's operations.

In this chapter, I argued that through an ethnographic knowledge of the scrap market combined with other knowledges—the corporate world, environmental science, ethics of recycling—Sahih Kaam employees were engaged in transforming e-waste into a fulfilment of responsibility. Knowledge freely circulates in market transactions but is also enclaved, similarly to the way in

which university education is reserved to be the exclusive property of the privileged. In a recent phone call, my friend and transparent recycling plant owner Mohsin told me, "We are still working like that, we had formalised, but we are still working like *kabadiwallas*" [*hum abhi bhi aise kaam kar rahe hai, hamne formalise kiya hai, lekin abhi bhi kabadiwalle jaise kaam kar rahe hain*]. Mohsin's struggle, the realisation that a regularised recycling plant is still not a way into the corporate world, emphasises that acquiring knowledge for economic value transformations is tied up with particular ethics and aesthetics. For Mohsin, it is no longer enough to be able to make a deal, buy cheap and sell dear, he is on a quest to turn around his business. Yet, he found that, despite a university education, a job experience at court, his ambitions to run a business at a par with Sahih Kaam are continuously thwarted by his lack of experience, knowledge, relationships, English competence, and cultural references, which allow the PRO to do its work responsibly.

Conclusions

Recently, two years after I had left the field, I attended remotely an online event organised by Sahih Kaam for International E-waste Day on 14 October 2021. Much has happened in the meantime. The online event is symptomatic of the changes ushered in by the pandemic as well as the two years' advances in creating business models and success stories in e-waste. The event gathered a good crowd of speakers and an even larger number of attendees. The impressive speakers' list bore witness to the fact that Sahih Kaam was not sitting idle in the intervening time but, despite the hurdles of the pandemic, strengthened professional relationships with producer brands, government representatives, national and international regulators, and other social businesses in the sector. This was clearly a *matlabwalla* event, an event that mattered, populated by speakers that mattered. Yet, the content of the discussions did not appear to have moved on significantly from the event detailed in the introduction. As one of the panellists declared: "I remember having the same conversations ten years ago, the more things change the more they stay the same." The most striking continuity was how each speaker talked as if they were all talking about the same e-waste issue, yet they often directly contradicted each other. The discussion was aimed at how to involve all stakeholders, but instead of agreeing on one, the various speakers each found a different actor in the value chain responsible for the underperformance in the sector.

The keynote was given by Thomas Lindhqvist, again like in 2019, who emphasised the importance of government enforcement for EPR to work well. The producer brand representative and a behavioural expert said it was good to listen to the policy perspective, but really the unrealistic consumer expectations for high incentives were to blame. A global recycler and smelter representative found faults in low collection rates elaborating on the way consumers have been irresponsible. One government representative talked of the need to promote infrastructural capacity and transparency. The other, a chairman of an SPCB (State Pollution Control Board), bluntly lashed out at the economic mindset of producer brands expecting financial returns on such a crucial question facing humanity. He asked: If brands are so good at selling products at "the front end" that now phones are found in the remotest village, why are they not as successful at reverse logistics? In plastics and municipal solid waste management, governmental actors must contend with unorganised manufacturers, distributors, waste pickers, but the e-waste sector brings together the brightest minds with big brands and big PROs, so how come that figures are still so dismal? After all, if there is about ten times as much gold in 1 ton of e-waste than in gold ore, should that not make e-waste recycling the most profitable of all waste streams?

The SPCB representative's questions go to the heart of the problem that this thesis explores. If there are so much valuable resources found in e-waste, and the need for a more ethical, responsible way to recycle is now widely accepted by both government and corporate actors across the world, why is it proving to be so hard to recycle? The answer, as I argued above, lies in the incommensurability between e-waste's materiality, economic value, and the ethical values of responsible recycling. However, these incommensurabilities are obscured by framing e-waste as a singular problem, which blurs the multiplicity of social worlds that e-waste straddles as a boundary object (Star 2010). The problem brings companies such as Sahih Kaam into being. The promise of overcoming the incommensurabilities rooted in the social conditions in which e-waste is embedded in is also the driver behind pursuing the alchemy of responsible and profitable recycling.

As the workshop went on and the various industry representatives presented business opportunities and success stories, a parallel story unfolded in the chat. One commentator named "informal sector (guest)" kept asking, "will you stop cheating from happening in the formal sector?" Satkar amplified this question at the end of the first session, offering panellists the chance to answer, but no one came forward. The insistent probing of the "informal sector" handle alerted to the absence of *kabadiwallas* as invited guests in the room. Moreover, there was very little mention of non-regularised scrap dealers during the two-hour programme, ostensibly aimed at thinking about all actors. Yet, scrap dealers continue to handle significant e-waste volumes as well as providing, as this thesis had shown, the backbone of Sahih Kaams responsible logistics. It may appear that in contrast to the early days of the Sahih Kaam's business development, the scrap market and *kabadiwallas* no longer feature as central figures in the narrative. However, this does not make their role less significant.

This closing vignette also demonstrates the wider issues connected to what happens when the market is expected to solve the environmental crisis in a field where the market incentive appears self-evident. Yet, the absence of those who in fact have been most successful at extracting materials and profit out of e-waste, the informal sector, is a telling omission. The elephant in the room in the recent online discussion, as in other similar events, is that there exists a vibrant, well-functioning market in e-waste, though it is not considered the right one, for it does not produce values commensurable with corporate interests and standards of environmental responsibility. At the same time, despite all the committed expertise, sums of money, founding of business initiatives, and regulatory developments, the e-waste ecosystem with its emphasis on environmental responsibility is in a constant state of market failure. The one question that is not being asked by anyone is whether the market rationale really is the best way to solve the e-waste problem in light

of all the complications. Even the chairman of the SPCB, who chastised the economic mindset of the producers, did so while reiterating: there was economic benefit in doing so, so why did they hesitate? As I argued in this thesis, the answer to this question does not only lie in different actors' shirking responsibility. Rather, the dismal collection and recycling rates may have more to do with the complexity and multiplicity of values that are to be reframed and commensurated when aiming to recycle responsibly. Rather than pointing to the actors' inadequacy, my thesis argues that the challenge is an anthropological one of keeping diverse actors' diverging interests aligned, which is never an easy task. Yet, the stakes in case of success are all the higher the more impossible the task ahead may seem.

At the heart of these questions about the market's failure to sort out the e-waste problem are a series of value judgements and transformations. The thesis has traced ethnographically how these value judgements (Fourcade 2016) are made and how value transformations are brought about based on them, foregrounding the struggles of the PRO in getting right the measures of the different kinds of values involved. The nominal category judgements of "informal" and "formal" are the most fundamental ones operationalised by Sahih Kaam to create the grounds for commensuration. To address the question, the first five chapters in this thesis take the reader through the various types of values one by one and elaborate them in light of their relevant anthropological theories. In contrast to the worthwhile anthropological endeavour to find one or another type of value the most pertinent to describing and explaining the human experience, hierarchies and systems of production, my work examined values as a basis for judgements and the value transformations they made possible. Thus, I was interested in the way each type of value becomes the basis for another one and how each is harnessed in the struggle to create responsible recycling channels that are also profitable. In this way, my work also questions the idea of Dumontian "holism" (Dumont 1980; Robbins 2013) where one paramount value is used as an explanation for social formations. Such an approach would erase the awareness that the existence and production of multiple value scales creates the grounds for making "marginal gains," profits at the margins of material thresholds, social hierarchies, and economic systems (Guyer 2004). This draws attention to the productivity of the series of contradictions at the centre of the e-waste problem engendered by the incommensurability of an ethics of responsibility and economic value in a saturated social landscape. In this way, in this thesis, I demonstrated that, for the economic success of responsible recycling, the key is to reframe various values into a newly configured value regime. The PRO and its struggles bear witness ethnographically to the challenges and the stakes of such value transformations.

The second and third chapters of my thesis detailed the way in which e-waste has been configured as a problem to present the grounds on which possible interventions can be conceived of. In this sense, the nature of e-waste as a problem shapes the market opportunity. Yet, there is very little that is natural about the e-waste problem as it has emerged historically and been configured as a social issue. Historically, e-waste has been framed as a problem of the "informal sector." This formulation supposed that, once formal structures and business interests were to take over, the issue would be solved. Thus, these chapters were conceived of in relation to how "the informal sector" had been represented in the media, reports, and advocacy material. In the second chapter, I examined the way discarded electronics are collected, aggregated, and broken down through a value chain operated by the Maliks, a Muslim caste group, whose economic activities and their material consequences are referred to as the informal sector. Through an examination of value as price, I argued that these circuits of scrap are financed through "marginal gains" (Guyer 2004) that accrue in each exchange through the conversions between different value scales. I took as my departure Appadurai's and Kopytoff's characterisation of objects moving in and out of commodity form between "value regimes" (Appadurai 1986; Kopytoff 1986). I argued that the "natural history of electronics" (Gabrys 2011) provides a good framework to understand how objects create multiple value regimes as they are transformed in the process of exchange. The bill of the logistical operation is footed through the selling of working order items and the material recovery of high value metals, gold, silver, and copper. This produces a gain structure that makes e-waste an expensive commodity rather than a valueless waste, which provides the grounds for the value struggle in which Sahih Kaam strives to suppress the price by proving that e-waste is indeed waste. If e-waste were an actual waste that people "dump," as it is often portrayed, then it would provide Sahih Kaam and other formal actors with much higher gains.

The third chapter explores how, to support the endeavour of defining scrap as waste, Sahih Kaam designs and conducts awareness sessions that are aimed at inculcating a sensory and embodied response to the toxicity of e-waste. The videos and advocacy material, originally produced as part of environmental campaigns, are used to create an "embodied value" (Ecks 2022), which draws on the potential of materials to turn into negative value in the environment and human bodies. Yet, despite the overwhelming evidence to the negative effects of e-waste, Malik *kabadiwallas* demonstrate a much more ambivalent attitude towards the toxicity of their work and living spaces. I argued that to understand the contradiction between these contrasting positions, we need to follow what is at stake in the process of proving or disproving the toxicity of localities and the toxic effluents as a result of labour processes. The endeavour to prove toxicity is intended at governments and corporates to take action, but in fact undermines the exchange value that Maliks

are able to extract from e-waste's remaining use value. The chapter demonstrated the importance of attending to the potential to produce negative value in the form of the release of chemotoxic substances as a particular form of use value. Negative value, then, has a double effect. On the one hand, it settles on landscapes and people in a similar way to ritual pollution, which also has roots in caste-based notions of substance transfer in a local ecology of harm. On the other, it creates the basis of intervention for Sahih Kaam.

The government's and the industry's challenge is to design better markets that fulfil the great investment potential imaginatively calculated and recalibrated every year through reports (Baldé et al. 2017; Forti et al. 2020). The fourth chapter detailed the solutions offered by the legal framework that enshrines extended producer responsibility (EPR), a policy tool that has had success in Europe and elsewhere. Sahih Kaam takes as its departure the legally mandated EPR framework and couples it with the concept of circular economy, which is fast gaining ground as the holy grail of the environmental solutions and unlimited economic growth. In the absence of effective government enforcement, the lax rules and regulations become occasions for "cheating" in the sector as Satkar's question implied. I have shown in the chapter that cheating means compliance on paper without corresponding material flows and regeneration. The conditions prompted Sahih Kaam to work out what I called "material arrangements of honesty," which means making possible extensive auditing and transparency practices. The endeavour is underpinned by a language of ethics to prove the necessity of such arrangements in the face of rampant "paper trading." Yet, I demonstrated that, to establish circular economy, Sahih Kaam has to pacify a multiplicity of unruly circles and to reframe value into new regimes, to make virgin material replaceable with secondary resources. "Material arrangements of honesty" involves those practices which are aimed bracketing out e-waste's potential to turn into negative value, in the form of pollution and low-quality recycled material. At the same time, documentation of e-waste flows is crucial to making recycling and its end products commensurable with values as defined in corporate responsibility.

Given the premise of e-waste as a problem of the unruliness of the informal sector, chapter five examined the "impact" of Sahih Kaam's activities. My interlocutors as Sahih Kaam framed the question of impact through their relationships with their aggregators in the e-waste market. They were particularly interested in the question of whether there has been a behavioural change among *kabadiwallas* as a result of their formalisation as "aggregators." To understand the aggregators' roles and the expectations placed on them, I examined this question as part of a wider range of relations cultivated in what Sahih Kaam referred to as "the e-waste ecosystem." Through examining the way Sahih Kaam ordinalised (Fourcade 2016) its producer clients, I traced desirable relations and

contrasted them to undesirable ones, based on the ordinal values placed on individual producer brand images and the cardinal numbers of the targets assigned to each. The producer contracts specify targets for collections and awareness, and these contracts provide Sahih Kaam's capacity to act and the company's need to establish exchange relations with aggregators. However, the latter in turn participate in the exchange relationship established for the sake of fulfilling targets in pursuit of their own agenda defined by their caste-based ethics. I argued that the PRO discerns which producers will improve their status as an ethical company when establishing client relations, while *kabadiwallas* pursue a different set of ordinalised relations through marriage in the collective goal of class mobility. This, then, challenges the widespread prejudices that the Maliks had earned their wealth from illegitimate trade for individual gain. Rather, they can be seen as living out their caste-based notions of ethical life when ethics means "a good life" (Laidlaw 2014). The chapter ethnographically demonstrated how different actors in the value chain may come together for a common cause, i.e. responsible e-waste recycling, in pursuit of widely diverging but in their own right still ethical, projects based on particular perceptions of a common good.

In the final two chapters, I focussed on the issue of knowledge as it emerged from the field as an ethnographic category. In chapter six, I examined what it means to "have knowledge," a commonly espoused claim by *kabadiwalla*s. I argue that this claim showed that knowledge was a kind of value that demonstrated capacities to make business and effect material and economic value transformations (Sanchez 2020). To navigate the scrap market, one had to have knowledge. Knowledge's value increased in the context of market competition by being closely guarded for the competitive advantage it bestowed on its possessor in making deals. I argued that knowledge operated as a form of capital that could be leveraged over others especially when it came to selling to the PRO. In chapter seven, I examine how employees of Sahih Kaam had been in search of the knowledge of *kabadiwalla*s and appropriated some of it for their own purposes once they had found them. The PRO, however, also relied on other forms of knowledge including the knowledge of their young middle-class staff who were trained in international institutions in environmental science. The business also relied on its founder's knowledge of the corporate world and environmental compliance, which he imparted to his employees. I argued that these knowledges are the key to effecting the ultimate value transformation of informal waste to formal e-waste, and the transfer of polluting materials into responsible recycling channels. Yet, this is a value transformation that is made impossible by the incommensurability of economic value and ethical values (Lambek's 2008). This incommensurability is the reason why the PRO's work appears so hard, but the promise of the ethical goal and the glory of making it an economic success too, is what makes it worthwhile for employees to endure low pay and long working hours.

In this thesis, I was interested in examining what would count as proper recycling, since most accounts of e-waste recycling narrate its opposite—what is wrong and improper. The case of Sahih Kaam provided an engaging and revealing ethnographic example through which to examine the different contradictions that a successful business should smooth out to provide a solution to the e-waste problem. The PRO provides the prism through which to understand the challenges of developing a new, responsible, ethical, and profitable e-waste recycling in the wake of the E-waste Rules of 2016. The legal framework and the principle of EPR enshrined within as well as the PROs ethical focus on the circular economy highlight the impossibility of the task ahead. Circular economy appears as an unquestioned principle in Sahih Kaam's business model, revealing of how the promise of the market and unlimited production has been fast replacing any other paradigm in solving the current waste and environmental crisis. This argument goes beyond e-waste recycling in light of the increasing demand for recycled goods and the extensive engagement of producer brands in tackling the environmental crisis.

The imagination around putting waste into productive use promises not just an economic solution, but also a solution for the wider economic and environmental crisis. The current challenge for policymakers and industry players is understood as working out the practicalities of turning waste that has until recently been considered an byproduct into a productive substance. As another speaker at the online event said, "Not only is it good CSR, but it is also good business, also good marketing, also what the consumer wants." The global economy and economic growth in the latter half of the twentieth century has been premised on producing and selling more and more goods. This trend was only let loose in India following market liberalisation in the early 1990s. This pace of growth, as many have shown, became possible by planned obsolescence, producing goods in a way that they become waste fast, to make way for new products on the shelf (Giles 2014). This system of production has been reaching its limits in terms of the engulfing waste crisis. The North Atlantic gyre and the hellscapes of Delhi's and Ghana's e-waste burning sites are the most evocative, sensory examples and metaphors of the earth reaching its carrying capacity. At the same time, economic growth requires an exponential growth in demand for new products. The promise of ethical, transparent, and auditable recycling and circular economy's closure of material loops holds the promise of tackling both. The question is how the negative potential of waste can be done away with to allow for the continued production of new commodities. The secret lies in producing products that are certified and labelled as recycled. Recycling is no longer just an environmental practice, but it is fast becoming the most effective market device of the century, the next water bottle (Hawkins, et al. 2015). A constantly heightening sense of the planetary crisis is increasing the demand for recycled products, to help consumers take part in planetary care

through continued consumption (Gregson et al. 2013; Gregson et al. 2015). To make such products possible, there is a heightening demand for "compliance infrastructures" (Babb 2020) such as Sahih Kaam's "material arrangements of honesty," which allow for the reframing of values by bracketing out the negative potential of waste to affect the environment. Certification and quality control of secondary resources is key to the development of products, such as Fairphone (www.fairphone.com/en), produced from sustainable materials and sold under the tagline "the phone that cares for the planet." The brand had documented the sourcing of each component promising the customer to be made of, for example, violence-free gold. Fairphone shows that such quality control includes delimiting the negative social as well as environmental effects of consumption. For such projects to be successful, economic value has to be made commensurate through extensive documentation of social and environmental values. At the same time, such "compliance bureaucracy" (Babb 2020) given that it does not involve the state, gains its authenticity through the brand name, a nominal value. I thus argued that the process of commensuration between economic value and ethical goals remains incomplete, providing an occasion for continuing to struggle and act in pursuit of the good (Graeber 2001).

On the ground, the results of leaving it to the market are ambivalent. In Delhi, depending on how one looks at it, Sahih Kaam might be making incremental change in the industry, or the company might just be another loop in materials where nothing is leading anywhere. Producers are pledging enormous amounts of money and collectible e-waste to the CPCB, but whether these lead to material regeneration is anyone's guess. The laws and the profit incentive they introduce are fuelling the proliferation of informal malpractices in what should become formalised recycling. Maliks and their scrap trade continues to be in control over subcontinental flows of e-waste, effectively metabolising waste and creating secondary resources. Yet, these secondary resources do not count towards the fulfilment of EPR and remain undocumented. At the same time, it is undeniable that the Malik value chain ends up feeding secondary resource recovery units that cause environmental harm. The law is clearly in need of recognising the *kabadiwallas*' contribution. But the idea of leaving logistics to *kabadiwallas* while taking control of recovery processes expressed by Satish Sinha of Toxics Link ignores the gain structure built into the Malik value chain. Without gold and copper recovery and secondary resale of working order items and parts it would not be profitable for the Maliks either. I believe that the only way would be to build a compliance bureaucracy starting with the logic of the scrap trade, regulating the already existing processes, instead of trying to channel material away from the scrap market and close it down.

The potential for environmental compliance bureaucracies is widely applied, as can be seen from the job profiles of some of my interlocutors at Sahih Kaam. Even in the case of brand-driven circular economy, producers who work with Sahih Kaam are now enquiring whether their own branded waste material can be collected under their EPR, so that these can be fed back into their own production processes. Sahih Kaam's business model, which includes great capacity and flexibility to work with a wide range of actors at the same time, holds a key for the future of private company-led waste management and environmental compliance. Making producers take responsibility not only for selling products, but also for the products' lifecycle, may sound like a great move forward in shifting responsibility from the individual to the producer. At the same time, however, the move opens up space for large international companies with global manufacturing and sales interest to define what it means to be environmentally responsible. And that sometimes may mean, as demonstrated in chapter four, that the order of the three Rs of waste management—reduce, reuse, recycle—may be circumvented.

Anthropologists as keen observers of the human condition and long interested in questions of values have a central role to play in examining the effects of such interventions. To evaluate the project of e-waste's formalisation, the judgements underpinning environmental advocacy should be examined. Through my exploration of the e-waste issue, I have shown, even if it is a relatively new phenomenon, that some aspects of "the problem" can be better understood through exploring local judgments of worth. Categories underpinning the e-waste problem are based on aesthetic sensibility and rooted in local hierarchies integrating class and caste. It is through such an ethnographic attention to local hierarchies that I found out about the caste identity of the *kabadiwalls*, which provide the concerns about toxicity and its impact in the community with a whole different interpretation. The Maliks are only one Muslim caste group that handles a specific waste stream, but there is piecemeal evidence that other Muslim groups are becoming specialists in particular kinds of secondary materials across India. There is not enough evidence and further research is required on the larger scale social change suggested by the shifts in traditional occupational structures. Yet, it appears that there are significant economic opportunities opened up by the large-scale discarding of consumer items in India, a country of great inequalities and considerable un- or underemployment. And it is low- and middle-caste Muslims, traditionally not associated with the removal of waste, who are reaping the benefits and are straggled by its implications.

One possible explanation might lie in the fact that e-waste does not ritually pollute; e-waste removal does not have the same connotations as removing soiled household waste. The contrast

lies in e-waste's duality; it is not only waste but is also a resource. E-waste is an example of a particular "equivocation" (de Castro 2004) where actors of formalisation try to convince consumers and scrap dealers that e-waste is hazardous, so that they could impose their own framing of it as resource. The effect is that negative value arising from both chemotoxic substances and the wider social judgment of scrap trade as illegitimate settles on the people and landscapes. This might stop other groups that have other avenues for social mobility from moving into the scrap trade. But Muslims who are marginalised in contemporary India find scrap trade an avenue of social mobility. At the same time, the social relations and the enclaving of knowledge required for trading in the sector might also be a deterrent for members of other castes from moving into the sector. These, however, in the absence of solid data, data that is hard to come by, remain mere speculations and provide possible further ground for research.

The relationship of the PRO and the Maliks demonstrate a complex interplay of cooperation and competition. The relationship of cooperation and competition between starkly different social groups in the metropolis of Delhi points towards the need to go beyond a simplistic characterisation of class relations in the city. Marxist framing of waste work had focussed on the dispossession of waste workers (Gidwani 2015; 2013; Gidwani and Corwin 2017; Baviskar and Gidwani 2019) through laws that are the result of "bourgeois environmentalism" (Baviskar 2003; 2020). In recent years, there have been some examples of the class conflict dissolved into middle-class activists making common cause with waste pickers in opposing the Okhla waste incinerator (Demaria and Schindler 2016). However, the case of the PRO and the Maliks provides a kind of class relationship that has not been explored before. As I argued in chapter five, for some Maliks establishing an exchange relation with the PRO had provided opportunities for social mobility which builds on Malik notions of "the good life." Yet, the PRO has also been participating in the larger effort of the "formalisation" of e-waste, which is aimed at closing down the scrap market and putting Maliks out of business. Towards the end of my fieldwork, some in Kabadabad echoed the sentiment that there might be a time when there will not be an e-waste market anymore, which is also how Mohsin rationalised his move to start a formal recycling plant. My ethnographic material builds upon the kind of social relationships that have been of interest in South Asian anthropology but also improves upon them to open up the debates about class and caste again. I argue that the megacity provides a fascinating macrocosm of unlikely, unacknowledged alliances when one begins to look for them.

The economic relationship at the heart of this thesis becomes the prism through which to view how radically unequal relations and close contact across classes and communities can become the

basis of learning and mimesis. For through the process of interaction, the middle class, upper-caste employees of Sahih Kaam had become *kabadiwallas*, if high-tech, and the Maliks had come one step closer to become part of the middle class that they aspire to be part of.

Postscript

As I write the closing sentences in this thesis, news of great looming changes reach me. Amit, my associate at Sahih Kaam who runs their dismantling plant, has just told me that the new E-waste Rules had just come out on 19 May 2022. He sums up the changes in a short text message: "1. PRO licence cancel 2. Collection centre cancel 3. Dismantler cancel." It turns out that the new law does not have any provision for actors other than producers and recyclers. As the rules are so recent, he does not know what this will mean for Sahih Kaam, but it is likely to mean that they will just have to operate as recyclers. For a moment, the ground is pulled out from under all the structures and equivalences that have been carefully worked out during the past four years. How the new legal framework will affect the way responsible e-waste recycling works is yet to be seen. The paths created for equivalence between incommensurable values under the previous legal framework will most likely inform the practices that are worked out to comply with the new framework. Yet, no other event could highlight the agentive effects of a legislative framework as effectively as the removal of the legal foundations on which a business has been built.

There are also other large-scale changes afoot, with MeitY (Ministry of Electronics and Information Technology) planning to establish an industrial eco-park where recyclers could rent spaces. However, where these plans are leading and whether they will provide a space for *kabadiwallas* who want to move out of the informal sector remains to be seen.

There have been other far-reaching changes for my interlocutors at Kabadabad. Shaheed, the first *kabadiwalla* to sell to Sahih Kaam was blacklisted for selling low quality, "cannibalised" waste and had not been reinstated. He acknowledges this from time to time with a sad voice on the phone. The pandemic and the riots prior to that had not been easy on the market, stopping the flow of e-waste for long weeks at time, but I have been unable to assess the effects of the lull of work. All my friends are married, some with babies and some expecting their first. The pandemic had prevented me from attending their weddings.

The cancellation of PRO and dismantler licences will have repercussions in Kabadabad, too. Those aggregators that had moved toward supplying waste to PROs might lose some business.

Mohsin's business venture, however, is charging ahead full speed as he has acquired significant investment to set up an integrated recycling plant. He uses his intimate knowledge of the e-waste sector to provide a service that no other ex-*kabadiwalla* can replicate given his commitment to environmental responsibility. We are planning new research on how to create a business model from Malik's experience with the scrap trade and the low-technology solutions, but controlling the harmful effects.

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