Invisible Spaces

Variegated Geographies of Waste in China

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ABSTRACT

With millions of people involved in collecting and treating recyclable products, waste recycling provides a critical entry point to an investigation of the spaces and dynamics of the Chinese economy. Based on sixteen months of in-depth ethnographic research, this thesis, 'Invisible spaces: variegated geographies of waste in China', describes and analyses waste and its boundaries, as well as the actors that deal with it at different scales within the country. The work examines how waste circulates, how it is regulated, and how it is represented in China. It presents stories of the people and places that configure the waste industry, and situates its analysis at the intersection of three different strands of literature: i) variegated capitalism; ii) informal economy; and iii) geographies of waste. The research contends that the 'afterlives' of goods are a productive prism which can be used to understand the variegated mode of capitalism in contemporary China and thus investigates the following question: to what extent do the different cultural, social, political, economic, and material dimensions of waste reveal the heterogeneous characteristics of Chinese capitalism?

Central to my analysis is the concept of *invisibility*. I conceive invisibility as a socio-political process that brings about an uneven access to resources and labour for subaltern groups, as well as a relational concept encompassing the three complementary and dialectical dimensions of absolute, relative, and relational space. Invisibility is not only a metaphor to define the agency of informal workers, but also an allegory to describe the marginalisation of their activities and spaces. It is an asset and a curse, a condition and a strategy. These multiple dimensions make invisibility a productive device bringing to light

the geographies of different accumulation regimes and everyday practices, as well as a potent tool to analyse the alternative representations of waste, value, labour, and development at play in contemporary China. With this in mind, the thesis engages with a number of important debates in geography. In particular, the five empirical chapters engage with literature on global production networks, labour geography, primitive accumulation, geographies of waste, and urban political ecology. While drawing these literatures into conversation with the variegated capitalism framework, the work suggests that the invisibility of waste activities is a powerful tool to analyse the nature and the mechanisms of the variegated modes of production in contemporary China.

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TABLE OF CONTENTS

ABSTRACT II

ACKNOWLEDGEMENTS IV

LIST OF ACRONYMS IX

LIST OF FIGURES XI

INTRODUCTION 1
- Hazard, Commodity, and Parallax Object 3
- Structure of the Thesis 12

1. LITERATURE REVIEW 18
- Introduction 18
- Varieties of Capitalism and 'Variegated Capitalism' 21
- Informal Economy 33
- Geographies of Waste 45

2. METHODOLOGY AND FIELDWORK 55
- Introduction 55
- Fieldwork 58
  - *Pre-fieldwork Activities* 58
  - *Semi-structured Interviews and Recruitment of Informants* 60
  - *Relationship with Local Academics and Positionality in the Field* 64
  - *'Waste Markets' and the Local Informal System* 67
  - *Data Analysis* 71

3. A BRIEF HISTORY OF WASTE AND RECYCLING IN CHINA 74
- Introduction 74
- Republican China 75
- Maoist Rule 77
- Reform Era 80

4. VARIEGATED RECYCLING: POWER, PLACE, AND MATERIALITY OF WASTE 82
- Introduction 82
- Local Informal System 87
  - *Variegated Capitalism, Industrial Districts, and Invisibility* 87
- Informal Recycling in Beijing 94
  - *Mapping Beijing Recyclers* 94
  - *Dongxiaokou – Relational Assets and the Power of Waste* 100
  - *Xiejia – Industrial Symbiosis and Materiality of E-waste* 105
  - *Internal Forces and External Threats* 110
- Conclusion 112

5. THE ENCLOSURE OF 'WASTE LAND': RECYCLING, URBANISATION, AND ECOLOGICAL DOMINANCE IN BEIJING **115**
Introduction 115
From Primitive Accumulation to Ecological Dominance 119
The Enclosure of 'Waste Land' 126
The Enclosure of the 'Waste Commons' 134
Conclusion 139

6. GEOGRAPHIES OF INVISIBILITY: LIVELIHOOD STRATEGIES, INFORMAL LABOUR, AND WORKER AGENCY **142**
Introduction 142
Geographies of Invisibility 148
Lao Zhang or the Invisible Man 155
Myth, Mianzi, and Modesty 163
Conclusion 170

7. VARIEGATED GEOGRAPHIES OF ELECTRONIC WASTE **172**
Introduction 172
Far East and Far West 179
For a Few Dollars More 181
The Good, the Bad, and the Ugly 186
Conclusion 198

8. THE POLITICAL SPACE: URBAN POLITICAL ECOLOGIES OF WASTE IN CHINA **200**
Introduction 200
Embedded Environmentalism 203
Nature University 207
The Asuwei Case 209
Advocating for Beijing Recyclers 212
Hongfuyuan Environment Protection 218
Background of the Project 218
The Pilot Project 221
Conclusion 225

CONCLUSION **228**
Variegated Spaces of Waste and Value 229
Variegated Spaces of Invisibility and Agency 232
Major Contributions and Future Research 234

APPENDIXES **240**

BIBLIOGRAPHY **265**

LIST OF ACRONYMS

Acronyms in the Text

AAG	Association of American Geographers
ACFTU	All-China Federation of Trade Unions
ANT	Actor Network Theory
BAN	Basel Action Network
CHEARI	China Household Electric Appliance Research Institute
CHEW	China's Health, Environment and Welfare
C-M-C	Commodity-Money-Commodity
CME	Coordinated Market Economy
CPC	Communist Party of China
CRT	Cathode Ray Tube
EEE	Electrical and Electronic Equipment
EFEO	École Française d'Extrême Orient
EIA	Environmental Impact Assessment
EMR	Extended Metropolitan Region
ENGO	Environmental NGO
EPB	Environmental Protection Bureau
EPR	Extended Producer Responsibility
EU	European Union
FON	Friends of Nature
GO-NGO	Government Organised NGO
GCC	Global Commodity Chain
GDN	Global Destruction Network
GPN	Global Production Network
GRN	Global Recycling Network
GVC	Global Value Chain
HH	Haidian Huishou Gongsi (Haidian Recycling Company)
ID	Industrial District
ILO	International Labour Organisation
INALCO	Institut national des langues et civilisations orientales
IT	Information Technology
LIS	Local Informal System
LME	Liberal Market Economy
M-C-M	Money-Commodity-Money
M-C-M'	Money-Commodity-Money plus surplus
MEP	Ministry of Environmental Protection
MIIT	Ministry of the Industry and Information Technology
MOFCOM	Ministry of Commerce
NDRC	National Development and Reform Commission

NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
ORDIF	Observatoire Régional des Déchets d'Ile-de-France
PRO	Producer Responsibility Organisation
QR	Quick Response
SASAC	State-Owned Assets Supervision and Administration Commission
SIEG	Summer Institute in Economic Geography
SVTC	Silicon Valley Toxics Coalition
TV	Television
UK	United Kingdom
UPE	Urban Political Ecology
VoC	Varieties of Capitalism
W-NP-W	Waste-New Product-Waste
WEEE	Waste Electrical and Electronic Equipment
WEIGO	Women in informal employment globalizing and organizing

Acronyms in Bibliography

AZ	Arizona
CSR	Corporate Social Responsibility
DEEE	Déchets d'Équipements Électriques et Électroniques
EWAS	E-Waste Academy – Science Edition
HARS	Home Appliance Replacement Scheme
IAS	Institute for the Advanced Study of Sustainability
IDPM	Institute for Development Policy and Management
IDS	Institute of Development Studies
IEEE	Institute of Electrical and Electronics Engineers
IIIEE	International Institute for Industrial Environmental Economics
INSEAD	Institut Européen d'Administration des Affaires
IPCBEE	International Proceedings of Chemical, Biological and Environmental Engineering
IPR	Individual Producer Responsability
ITRES	Istituto Toscano di Ricerche Economiche e Sociali
MA	Massachusetts
MD	Maryland
MIT	Massachusetts Institute of Technology
NLRB	National Labour Relations Board
PET	Polyethylene Terephthalate
REEI	Rock Environment and Energy Institute
SCYCLE	Sustainable Cycle
STEP	Solving the E-Waste Problem
UNU	United Nations University
WIDER	World Institute for Development Economics Research

LIST OF FIGURES

Chapter 2
Figure 1. Map of Dongxiaokou, late 2014. 68
Figure 2. Reports, Carlo Inverardi-Ferri and Tao Dongyan 70
Figure 3. Photographs 71

Chapter 4
Figure 1. Waste markets in the outskirts of Beijing 97
Figure 2. Individual collectors 97
Figure 3. Small warehouse in central Beijing 98
Figure 4. Waste or commodity? 99
Figure 5. Activities in Dongxiaokou 102
Figure 6. Wuting lu – 'ballroom road' in Dongxiaokou 104
Figure 7. An artisan at work in Xiejia 107
Figure 8. A transaction in Xiejia 109

Chapter 5
Figure 1. Demolitions in Dongxiaokou 134

Chapter 6
Figure 1. The *da yuan* and the scooter of Lao Zhang 158
Figure 2. Precious commodities in a recycler's life 162
Figure 3. Restaurants in Dongxiaokou offering the Gushi goose 165

Chapter 7
Figure 1. Workers dismantling CRT TVs in a formal company in Guiyu, Guangdong, China 186
Figure 2. Workers dismantling mobile phones in an informal workshop in Guiyu, Guangdong, China 191

Chapter 8
Figure 1. Lao Wang at the 2014 Zero Waste conference in Shanghai 215

'The capitalists know that all commodities, however tattered they may look, or however badly they may smell, are in faith and in truth money, […], and, what is more, a wonderful means for making still more money out of money.'

KARL MARX, *Capital,* ([1867] 1976, p.256)

INTRODUCTION

'En feuilletant un tas d'ordure on peut reconstituer toute la vie d'une société'[1]

Marcel Griaule and Michel Leiris*, Instructions Sommaires*, (1931, p.9)

Dongxiaokou was an urban village in the northern periphery of Beijing, which in the early 2000s became a major hub for waste recycling. Before a project brought about the redevelopment of the village in 2015, dozens of "waste markets" were established in the area. Every waste market in Dongxiaokou followed the same simple principle: it was organised in a grid of alleys. Some alleys were a hundred meters long or more. Flanking the alleys on each side were dozens of workshops. Every workshop appeared more or less the same. Behind a large entrance gate, they had a yard to stock materials and a small building, usually composed of at most one or two rooms, where recyclers lived with their families. Communal lavatories were situated outside the market. Guard dogs protected some of the yards while in others, chickens roamed freely. In the afternoon, the markets were usually silent while collectors roamed the city in their quest for precious scrap. At sunset, tricycles, cars, trucks and lorries full of refuse drove back to Dongxiaokou crossing the village in every direction, pouring clouds of dust and exhaust fumes into the air.

I met Xiao Zhang in Dongxiaokou. I remember that the village was still quiet on that early afternoon. I carried with me a satellite picture of one of the markets. Whilst walking through the alleys, I was writing down the materials treated by each workshop on my

[1] 'Through a heap of trash we can bring together again the entire life of a society.'

printed image. Over the previous months, I had come to Dongxiaokou so many times that my presence was not unusual anymore. Some of the workers were playing cards on the pavement by the local store, others were chatting: they had hardly noticed me. Suddenly, however, I bumped into a group of children who were all around ten years old. On any other afternoon, I would never have met them. But that day was a holiday and they were not in school. With a mix of surprise, excitement, and fear, they approached me and asked me who I was, where I was from, and what I was doing there.

'You are from Europe and you came here by subway!?' exclaimed Xiao Zhang in reply to one of my answers.

'No, I am from Europe and I came to China by airplane. Now, I live in Beijing. So today I came here by subway. First, I went to Xixiaokou by subway. Then, I walked all the way from Xixiaokou to Dongxiaokou.'

Xiao Zhang knew exactly which materials were stored in every yard. He could recognise them in a glimpse and tell me, in some cases, who the workshop's owner was. After all, he was born and grown up in Dongxiaokou, and knew all the mysteries of the waste market. He accepted to help me in my tedious task. We started to walk together through the alleys listing the workshops. It took us quite a bit of time to list every single one on the map. When we finished it was getting darker and Xiao Zhang invited me to his home. The parents of Xiao Zhang were relaxed and friendly, and were both from northern China. The father was a mechanic and was making a relatively good living in Beijing, fixing up the tires of the vehicles that drove along the rickety roads of Dongxiaokou. The mother was working as a part-time employee in a nearby orphanage. She invited me to join them for dinner. She prepared a warm soup as she told me about their life. We ate together in their small, humble house situated on the main street of the village, opposite the entrance of the big market I had visited that afternoon with Xiao

Zhang. The house was only composed of one room, which served both as home and workspace. I remember that on one of the exterior walls of the building, there was painted, in red ink, a solid Chinese character stating, "to be demolished".

HAZARD, COMMODITY, AND PARALLAX OBJECT

I landed in China equipped with a sophisticated theoretical approach, a solid methodological framework and a relatively clear number of research questions. But as soon as I started my research on the field, I discovered that I could not do much with all these useful tools. In fact, I was presented with a complex reality that slipped away from ordinary categories and that could not be defined simply by transposing theories and practices from one geographical context to another. What was left, thus, of my original project? Some research questions and part of the aim of the study. What had changed was the perspective. There is a reason for this: during my sixteen months of fieldwork in China, I understood that waste, while appearing mundane and trivial, is instead embedded with an almost mystical aura. As the ethnographic vignette above tries to suggest, waste is not only an environmental problem. It also contains the issue of culture and identity, is deeply connected with the struggle of people who come into contact with it, and has much to teach us about geography and history. This thesis focuses, therefore, on the political economy of waste through an ethnographic account of people and places that deal with waste in contemporary China. With millions of people involved in collecting and treating recyclable products, and many more making a living through a variety of activities generated by this industry, waste recycling provides a critical entry point to an investigation of the spaces and dynamics of the Chinese economy, as well as a powerful lens to examine the complex politics of this society.

A source of political conflicts (Seltenrich, 2013), recurrent scandals (Vidal, 2013; Wasley, 2011), and considerable geopolitical problems (EurActiv, 2013), waste is indeed a central challenge for contemporary societies. As our economies become more developed, so too do the processes of extraction of raw materials; manufacturing of products; consumption of commodities; and their rapid disposal (Connett and Irons, 2013). As a result, official discourses are usually informed by a twofold concern. On the one hand, they are dominated by a Malthusian fear of the capacity of environmental systems to support the hunger for resources and the waste production of a growing population (Lora-Wainwright, 2016). On the other hand, they highlight the potential for material recovery, and therefore foster the establishment of 'modern' waste management systems, often stigmatising informal modes of recycling (Baldé et al., 2015). These arguments are broadly mobilised to inform public policies and justify interventions in the interest of the common good across geographical landscapes. However, this narrative underestimates the improvements in technology and changes in market conditions that have delayed apocalyptic consequences of finite stock resources (Hudson, 2005; Martínez-Alier and Muradian, 2015), and overlooks the inextricable mix of social, economic, and cultural attributes (Robbins, [2004] 2012) that make waste not only a technical problem to be managed (Tong and Tao, 2016), but also an issue deeply rooted in the dimensions of time and space (Lora-Wainwright, 2017; Lora-Wainwright, 2016). Indeed, while some scholars describe waste as a severe cause of environmental externalities and social injustice (Joines, 2012), political ecologists usually outline that, at different latitudes, this peculiar matter is also a significant driver of employment and revenue (Lora-Wainwright, 2016; Schulz, 2015), and therefore a common resource (Gutberlet, 2012; Harris-White and Rodrigo, 2015; Harvey, 2011; Lane, 2011; Schindler et al., 2012).

While there is no waste in general, rather each discard being characterised by its particular materiality (Pickren, 2015), this thesis investigates how alternative conceptions of waste and waste management have important consequences in shaping the relation between humans and the physical world (Reno, 2015). Waste may appear to be mundane and trivial substance, but is instead a thing deeply imbued with mysterious qualities. Waste is the 'political other of "value"' (Gidwani and Reddy, 2011, p.1625) and therefore, the capitalist other of the commodity; a strange object that is both suprasensible and social (Marx, 1976). While it is in the process of exchange of different products of human labour that commodities, acquiring their dual nature of use and exchange values, come into being, waste appears, instead, when the process of exchange is interrupted, and values and meanings attached to objects disappear (Hudson, 2005). Waste can, however, metamorphose into a commodity when its meaning is reworked and different processes of commodification bring about new capitalist mechanisms (Hudson, 2005). Waste is then again brought into relation with products of labour and becomes the starting point of new rounds of production and value creation (Herod et al., 2013). Therefore, through a different perception of reality, the meanings attached to objects (Hudson, 2015) have important consequences in shaping circuits of waste and value as well as in producing modes of recycling and disposal. Symmetrically, disposal and recycling practices have consequences in shaping perceptions of waste and commodities as well as individual and collective imaginaries of environmental governance (Reno, 2015). In studying waste in contemporary China, this thesis, therefore, highlights the hiatus that exists between waste conceived as an object of management for environmental governance and waste as an object that exists in different spheres of society and economy, where it is conceived in some cases as a commodity and valuable resource, and in other cases as a environmental externality and hazard.

Following this line of argument, the thesis examines circuits of waste and value in China as well as their underpinning social relations, but also investigates the politics surrounding waste management. Today, a growing number of actors, such as independent activists, scholars, officials, NGOs, entrepreneurs, journalists, and local citizens, participate in discussing the social, economic, and environmental consequences of different modes of waste management in contemporary China (Johnson, 2013). Waste represents, therefore, a powerful tool to scrutinise different facets of contemporary Chinese society. In order to give an account of these different but interrelated dimensions, I build on the work of Sarah Moore (2012), who develops the concept of waste through the notion of *parallax object*. As presented in more detail in the literature review, Žižek (2004) defines a *parallax object* through its antinomies rather than its positive characteristics. Conceiving waste through its contradictions, i.e. as waste and value, as bearer of risk and profit, and so forth, is a useful perspective to focus on the multiple political and economic dimensions of this peculiar object of analysis.

This research describes and analyses how waste circulates, how it is regulated, and how it is represented in China. It presents the accounts of individuals and places that comprise the industry and situates its analysis at the intersection of three different strands of literature: i) variegated capitalism; ii) informal economy; and iii) geographies of waste. It contends that the 'afterlives' of goods are a productive prism which can be used to understand the variegated mode of capitalism in contemporary China and thus investigates the following research question: to what extent do the different cultural, social, political, economic, and material dimensions of waste reveal the heterogeneous characteristics of Chinese capitalism? In investigating this research question, the thesis engages with a number of important debates in economic and cultural geography. In particular, the five empirical chapters engage with the literature of global production

networks, labour geography, primitive accumulation, geographies of waste, and urban political ecology. While drawing these literatures into conversation with analytics on variegated capitalism, the work suggests that the *invisibility* of waste activities is a powerful tool to analyse the nature and mechanisms of the variegated modes of production in contemporary China. Here, I conceive invisibility both as a socio-political process and a relational concept. Drawing on labour geography and gender studies literature, I comprehend invisibility as a process that brings about an uneven access to resources and labour for subaltern groups (Spivak, [1988] 1994) as well as a conscious strategy to reach specific goals of integration and social climbing (McDowell, 2013). I thus delimit three different dimensions of invisibility, which are complementary and in dialectical terms with each other. These are the *absolute*, *relative*, and *relational* dimensions (Harvey, 2006; Lefebvre, [1974] 1991). Invisibility defines the agency of informal workers who deal with waste and also describes the marginalisation of their activities and spaces. These multiple scopes make the concept of invisibility a productive device to shed light on the variegated geographies of different accumulation regimes and everyday practices, as well as a potent tool to analyse the alternative and contrasting representations of waste, value, labour, and development at play in contemporary China. I therefore describe and analyse the penetration of different capitalist mechanisms (Hudson, 2005), examining how in some spaces the circulation of waste (and value) appears as a voluntary process, while at different scales circuits of social reproduction and material practices are created and maintained by coercive power, deployed through authority, control, and direction (Hudson, 2005).

This ethnographic study of waste in China is therefore constructed around two main axes. The first focuses on waste conceived as a commodity that circulates and exists in its dialectic nature of exchange and use-value (Dagognet, 1999; Herod et al., 2013; Herod et

al., 2013a; Marx, [1867] 1976). Here, I investigate the informal economy and waste recycling throughout these channels. I describe informal recycling activities as I have seen them during my fieldwork in the country. I analyse the socioeconomic mechanisms of informal recycling in Beijing, and building on the Marshallian notion of *industrial district* (Becattini, 2000; Grossetti, 2004; Hirst and Zeitlin, 1991; Piore and Sabel, 1984; Storper and Scott, 1992), I develop the concept of *Local Informal System* (LIS). I examine agglomerations of small and medium enterprises in the informal economy and their changes over time. I argue that informal recycling in Beijing is structured in a highly competitive and organised system, which evolves under the pressure of internal forces and external changes in the environment that are in part similar to the dynamics of the *industrial district* (ID) but that are characterised by their invisibility. The aim of this first part is, therefore, to give account of this 'sub-model' of capitalism (Zhang and Peck, 2014) in contemporary Beijing (Chapter 4), of the impact of other circuits of capital on the evolution of this system (Chapter 5), as well as of the individual and collective agency of actors that operate in it (Chapter 6).

While presenting this argument, I also engage with the literature of Chinese studies. Here, I am in dialogue with a number of works that have investigated issues connected with informal labour (Xiang, 2005; Xiang, 2000; Zhang, 2001), the political economy of Chinese capitalism (Fligstein and Zhang, 2011; Mulvad, 2014; Peck and Zhang, 2013; Yeung, 2004), and waste in China (Béja et al., 1999; Kirby and Lora-Wainwright, 2015; Kirby and Lora-Wainwright, 2015; Lora-Wainwright, 2017; Lora-Wainwright, 2016; Schulz, 2015). In particular, I engage with the research by Zhang Li (2001) and Xiang Biao (2000; 2005). Both scholars, in their pioneer works *Strangers in the city* and *Transcending boundaries*, examine a community of migrant workers from Wenzhou, established in an urban village in the southern suburbs of Beijing, known as the Zhejiang

village. This migrant community established the largest supply centre for low to medium priced clothes for the whole of north and northeast China in the 1980s (Xiang, 2005). In his work, Xiang Biao (2005) notes that these informal workers, transcending geographical, social, administrative and ideological boundaries, developed successful economic activities against the rhetoric of official discourse that stigmatised their action and instead promoted a different vision of 'modernity'.

Zhang Li describes the spatial and social configuration of this same migrant population to analyse the nature and dynamics of the Chinese economy at large. The scholar suggests that while the emergence of new markets provided important opportunities to improve the material lives of rural migrants, social and political tensions between this floating population, the state, and the urban society quickly arose. Zhang suggests that the study of these dynamics is productive in highlighting the nature and the particularities of the Chinese economy at large (Zhang, 2001). First, she contends that economic transformations in contemporary China would not necessarily lead to a complete dismissal of the socialist regime, which she defines as a 'late socialist' model. Second, she argues that the development of market forces in China is not to be understood as the result of foreign forces transplanted from abroad, but rather an endogenous process in its own terms (Zhang, 2001). Furthermore, she suggests, building on Gates (1996), that the kind of economic activities developed by migrant workers in Beijing represent a local form of petty capitalism. Wenzhou migrants in the metropolis developed their activities using family and kinship networks as well as clientelist connections with the local bureaucracy (Zhang, 2001). While creating, through these strategies, a specific 'community-based migrant power', rural migrants in the city represented a population 'out of place' and 'out of control', which forced the state to develop new strategies and mechanisms of control and regulation (Zhang, 2001).

While the works mentioned above are a source of great inspiration, I also contend that to push forward this research agenda it is important to move beyond the linear understanding of history and economic activity. As suggested by Chakrabarty (2000), 'every instance of capitalism development has a unique history' (Chakrabarty, 2000, p.47). While orthodox readings see the differences in local histories and geographies overcome in the long run by the overarching logic of capital (Chakrabarty, 2000), the thesis of variegated capitalism sees uneven development as an endogenous element of contemporary modes of production, which brings about not only a proliferation of different models but also more importantly contributes to the multi-scalar variegation of local capitalisms (Peck and Theodore, 2007). In other words, I engage in this research with the question raised by Gibson-Graham (2006) on the diversity and fragmentation of the economy. However, in my analysis I do not dismiss structures but conceive them in a dialectical relationship with geography and history. 'Capital is not a thing but a social relation between persons' (Marx, 1976, p.932), and this social relation is characterised by the quest for surplus value (Herod et al., 2013a), in particular for the production and appropriation of relative surplus value (Marx, 1976). Only when this social relation is realised does capitalism comes into being: money metamorphoses into capital and workers and capitalists confront each other in the labour market. Yet the historical avenues and geoinstitutional contexts that cause this particular social relation to emerge are characterised by their diverse and variegated contingencies (Peck and Theodore, 2007). This thesis, therefore, takes as an example the recycling industry in China to give account of the diversity in capitalist formations in a rising power (Hudson, 2016) and engage with major questions in economic geography.

In fact, my work not only analyses a local community of migrant workers, but it is also an ethnography of the specific matter that makes this economy (Brooks, 2015).

Interestingly, the story of Chinese waste is the tale of a population 'out of control' as well as the story of a matter 'out of place' (Douglas, [1966] 2002). As a result, while the first part of my research comprehends waste as the 'political other of capitalist "value"' (Gidwani and Reddy, 2011, p.1625), the second part of this thesis describes and analyses discards in contexts where they are conceived as manageable and governable objects (Moore, 2012). Here, I focus on waste legislation, particularly on e-waste (WEEE and Waste electrical and electronic equipment) and its enforcement (Chapter 7). This strategy is adopted to look into processes of formalisation and regulation of the industry and their impact on traditional actors of the sector. At the same time, this perspective is mobilised to analyse how the pressure of neoliberalising forces mingle with local characteristics (Brenner et al., 2010). Although Chinese legislators took inspiration from European directives, I argue that the formal recycling scheme for electronic discards eventually resulted in a very different institutional arrangement compared to the European model. Here, I also give account of environmental activism in Beijing and other major Chinese cities (Chapter 8). I analyse pilot projects for waste collection and recycling, the motivations to join them, as well as the decision-making process and power distribution among different actors. I describe and analyse environmental campaigns promoted by local NGOs focusing on waste. I examine how environmental NGOs and individual activists, research centres and universities, as well as informal and formal recyclers, social entrepreneurs, and public officials adopt different strategies to foster members' interests and organisational goals. This is done with the aim of showing the socio-political implications of waste (Hobson, 2015; Moore, 2012). I describe how these different positions confront each other in contemporary China in order to argue that the environment in general, and waste in particular, represents a political space where organisations and individuals confront and act as agents and sites of change (Castells, 1983; Saich, 2000; Wu, 2009; Yang, 2005).

STRUCTURE OF THE THESIS

The thesis is composed of ten chapters: an introduction; methodology; literature review; a short historical section; five empirical chapters; and a conclusion. The five empirical chapters and the conclusion provide the theoretical and empirical findings of my research. I briefly present these chapters in the following pages.

The first empirical chapter of this thesis, 'Variegated Recycling: Power, Place and Materiality of Waste', engages with recent literature on geographies of waste and global production networks. Recent geographical research on waste has interrogated global value chains (GVC), global commodity chains (GCC), and global production networks (GPN) frameworks to examine the circulation of end-of-life commodities and to challenge unidirectional and linear notions of economic activity. Engaging with this literature, the paper gives account of recycling networks in China. In particular, it describes and analyses social relations of production in the two 'waste markets' of Dongxiaokou (东小口) and Xiejia (歇甲) in Beijing, their supply chains, and the broader system of socioeconomic activities they are embedded in. First, the chapter argues that the circulation of waste, when analysed from a territorial perspective, reveals an organisation of production anchored in regions that are both a site of external economies and a locus of 'relational assets'. Second, it draws this research into conversation with analytics on variegated capitalism and contends that 'ongoingness' in economic activity is a process linked with capitalist dynamics and therefore its analysis reveals insights into the heterogeneity of contemporary modes of production. The appropriation of waste in different spatial and temporal contexts is a process that generates alternative mechanisms of value creation and capture.

Chapter 5, 'The Enclosure of "Waste Land": Informal Recycling, Urbanisation and Ecological Dominance in Beijing', discusses the concept of primitive accumulation and argues that Beijing recyclers are subjected to a twofold and ongoing process of dispossession. Besides the introduction of regulations and technologies resulting in the enclosure of the waste commons, I suggest that urban forces also contribute in divorcing recyclers from their means of production. Recyclers are separated from the land where their activities are carried out and divorced from the very resource that contributes to their livelihood. In doing so, the chapter engages with recent debates on the nexus between primitive accumulation and the informal economy. It contends that the literature has not yet offered sufficient arguments to conceptualise informality beyond the formal/informal divide. In this chapter I suggest that to overcome this impasse it is theoretically productive to engage with the concept of ecological dominance (Jessop, 2014) and to conceptualise dispossession as the result of the uneven impact of different circuits of capital or varieties of capitalism. Through an account of 'small stories' of individual recyclers, I describe and analyse the production of space in 'waste markets' and the changes in these markets over the past three decades. Existing literature on urban villages in China has described a number of factors affecting the creation of informal settlements in the peri-urban areas of large metropolises. According to this scholarship, the large afflux of migrant workers and their demand for affordable housing, together with the ambiguous property rights and land management system, brought about the emergence of informal settlements in contemporary China (Hsing, 2010). Scholarship also outlines how urban formal redevelopment does not eliminate these places, but rather relocates them to more remote parts of metropolises (Wu et al., 2013). In this Chapter, I argue that the production of space in 'waste markets', besides the factors above, is also determined by the economic activities carried out in these places. Economic activities, in turn, are shaped by the constant relocations and re-productions

of space. I therefore contend that the relocation of informal settlements due to urban redevelopment acts as a phenomenon of creative destruction and plays a major role in the evolution of 'waste markets' in particular, and of local informal systems in general. In the second part of the chapter I examine another process of dispossession, linked with the introduction of new technologies and regulations in the recycling industry. Here, I argue that alternative circuits of capital to the informal trade of discards drive this process. I suggest that the impact of this phenomenon on informal recycling is of a different kind compared to the effect of the urbanisation process. New technologies and regulations dispossess once and for all the petty recyclers from their resources and foster the passage towards new social relations of production. I therefore suggest that this change has the original flavour of the historical process of primitive accumulation.

Chapter 6, 'Geographies of Invisibility: Livelihood Strategies, Informal Labour, and Worker Agency', engages with literature on labour geography and suggests the analysis of informal workers, waged and non-waged, and their livelihood strategies as a productive domain of enquiry to foster our understanding of labour agency. This chapter largely engages with the concept of invisibility and grounds it around literature on gender studies and feminist labour geography. Gender studies have contributed in rewriting the history of culture, bringing female and gender perspectives into visibility (Butler, 1988). Similarly, feminist labour geography has engaged with issues focusing on the relationship between the sphere of reproduction and production (Teeple Hopkins, 2015). However, not many studies have articulated the concept of labour agency within the informal economy. Following this line of argument, I suggest that studying the individual and collective strategies of informal workers sheds light on different dimensions of agency and deepens our understanding of how workers actively participate in making the variegated and uneven geographies of contemporary capitalism. The chapter therefore

gives account of the everyday practices, both individual and collective, of informal recyclers in Beijing, and uses the concept of invisibility to understand their practices of social reproduction. Building on Coe and Jordhus-Lier (2011) I disaggregate agency in the categories of resilience, reworking, and resistance to avoid narrow definitions of agents and structures. Pushing this argument forward, I suggest that invisibility both constrains and enhances informal worker agency. Invisibility provides an uneven access to resources and labour, and also fosters the action of workers who rework and resist oppressive capitalist relationships, aiming at regaining control over their labour time.

Chapter 7, 'Variegated Geographies of Electronic Waste', engages with recent literature on electronic waste, particularly with the strand that has examined formalization processes and the implementation of a new formal development regime for the management of e-waste in China (Kirby and Lora-Wainwright 2015; Schulz, 2015). Firstly, I introduce legislation on Waste Electrical and Electronic Equipment (WEEE and e-waste) in Europe and China. Building on geography of waste literature, I then outline how the establishment of a formal management system in China confines e-waste to the territory of a single market as in the case of Europe (Kama, 2015). I thus suggest that choices for a particular type of waste governance not only have important environmental consequences, but also crucial economic implications. I also argue that modes of governing waste (Hobson, 2015), blending with a particular geoinstitutional context, foster and regulate different varieties of capitalism. In academic literature it is usually argued that Chinese legislators have introduced concepts of extended producer responsibility (EPR) and reverse logistics, borrowed from European directives, in order to build a similar system. However, as I argue in this chapter, the Chinese formal management system for electronic discards eventually resulted in a very different model. I thus provide evidence of this fact through a close comparative reading of legislation as

well as through the analysis of semi-structured interviews realised with major actors in the industry in China and Europe, and pursue a critical analysis of the formal e-waste management system in China informed by analytics on 'variegated capitalism'. I contend that while this process is often described in the literature as a shift towards neoliberal governance, a deeper understanding of this change needs to take into account the variegated and uneven geography of the phenomenon. I contend that in China, policy reforms are engrained in a particular geoinstitutional and cultural context that constrains their dynamic, while diverging forces towards a neoliberal adjustment together with the resilience of a traditional *dirigiste* state shapes the e-waste management system in an all new local form.

Chapter 8, 'The Political Space: Urban Political Ecologies of Waste in China' investigates the political dimension of waste, describing and analysing the politics around the management of discards. In this chapter I engage with two distinct bodies of academic literature: urban political ecology and the environmental politics of China. Building on Cavé (2015), Gutberlet (2012), Harvey (2011) Lane (2011), and Ostrom (1990) among others, I define waste as a commons. I suggest that choices for a particular technology and mode of governance are thus never neutral and often contested or promoted by different political actors. In the chapter, I present several examples, such as a pilot project for waste collection and recycling as well as anti-incineration campaigns and other activities led by local NGOs. I describe and analyse how different actors form different coalitions and adopt diverse strategies to foster specific goals. In so doing, I contend that the environment in general, and waste in particular, represents a political space, where organisations and individuals confront each other and act as agents and sites of change (Castells, 1983; Saich, 2000; Wu, 2009; Yang, 2005). Firstly, I suggest that in contemporary China a number of 'policy entrepreneurs' (Mertha, 2009) who focus on

waste issues, such as independent activists, scholars, officials, NGOs, and journalists, operate in the political cleavages of a fragmented policy system, promoting individual and organisational agendas in collaboration or in opposition with official bodies. In outlining these dynamics, I argue that the clash of divergent interests, the sharing of different ideas, as well as the collaboration in common projects, represents a political practice for those involved in these activities. This, in turn, contributes to reinforce participatory forms of decision-making at local and national scales, both through direct participation, for instance in environmental impact assessments, and also through an indirect influence that organisations and individuals have towards decision makers, participating for instance in conferences and pilot projects. I thus suggest conceiving waste not only as a political issue but also as a micro political space, an arena where different political actors confront each other.

Finally, the conclusion highlights the major points raised in this work. It assesses that capitalism in China is far from being a homogeneous phenomenon and its understanding needs to take into account the importance of theorising diversity across time and space. Building on these premises this last chapter indicates main avenues for future research projects.

LITERATURE REVIEW

CHAPTER 1

'Virtually every review of scholarship in urban geography, urban sociology, urban politics, and urban economics laments […] disorder and division. Well they should.'

Ira Katznelson*, Marxism and the City,* (1992, p.4)

INTRODUCTION

This research is situated at the intersection of three different sets of literature: i) Varieties of Capitalism and 'variegated capitalism'; ii) informal economy; and iii) geographies of waste. In what follows I will outline my objectives and how my work aims to contribute to these literatures.

The 'varieties of capitalism' (VoC) school has emerged as one of the most influential branches in comparative and heterodox political economy (Peck and Theodore, 2007). However, the growing literature has produced only a few accounts of the marketization process in China (Peck and Zhang, 2013). Moreover, VoC research on China and beyond, up to very recently, has exclusively focused on the formal economy (Williams et al., 2012), failing to recognise the major role played by informal actors, which greatly participate in the Chinese transformation (Huang, 2009). My research aims at filling this gap.

In a rigid bipolar approach, VoC literature seeks to classify world capitalism(s) according to the dichotomy between liberal market economies (LME) and coordinated market economies (CME) (Hall and Soskice, 2001). As a result, the few scholars who have produced works on China following this perspective have been confronted with difficulties in dealing with the multifaceted reality of the country. They have often reached divergent conclusions, describing the Chinese variety of capitalism sometimes as an American-style LME, sometimes as a France-style state capitalism (Fligstein and Zhang, 2011; McNally, 2008; Witt, 2010).

While critically engaging with the VoC literature, economic geographers have proposed an alternative approach, labelled as 'variegated capitalism', which highlights contradictions over coherences and better fits the purpose of studying countries such as China (Jessop, 2011; Peck, 2013; Peck and Theodore, 2007). Grounded in a Polanyian economic geography framework (Peck, 2013; Polanyi, 1944), the 'variegated capitalism' tool problematizes capitalism in light of its uneven development (Peck, 2013; Peck and Zhang, 2013). Valuable as it is, this project is still in its early stages. Despite criticising the mono-scalar and static framework of the VoC school, and advocating for a multi-scalar and dynamic perspective, 'variegated capitalism' scholars have not, to my knowledge, produced many works investigating China at a deeper scale than the regional one (Chang and Sheppard, 2013; Lim, 2010; Lim, 2014; Mulvad, 2014; Zhang and Peck, 2014). It is, therefore, the aim of my research to contribute to the 'variegated capitalism' project, filling this gap and informing the debate with my empirical study. In doing so, I focus on what I call 'Local Informal Systems' (LIS) for waste recycling in Beijing, which I will describe as observed during my fieldwork in China. I will also outline how these systems emerge, structure themselves, and interact with 'formal' waste management schemes, showing how, in the sector of waste recycling in China, different forms of capitalism

exist at different scales. I therefore use the concept of invisibility, as described in the introduction, to analyse the variegated modes of Chinese capitalism.

Surprising though it may seem, while many human geographers and economic anthropologists participate in both VoC/variegated capitalism and informal economy scholarships, very few contacts have been made, so far, between the two fields (Williams et al., 2012). My contribution is therefore to offer one of the first works linking these studies. Furthermore, the aim of my work is also to contribute to debates in geographies of waste (Moore, 2012). Together with Moore (2012), I adopt the definition of waste as a *parallax object* (Žižek, 2004; Žižek, 2006), and I focus on its contradictions, rather than defining it through its positive characteristics. In doing so, I pursue a double goal. On the one hand, I critically investigate what is wrong with dominant accounts (Walker, 2007). On the other hand, I explore less coercive and more inclusive alternatives (Gutberlet, 2012; Gutberlet, 2012a; Walker, 2006). As a result, I provide a counter-narrative focusing on the stories of informal actors in Beijing and give an account of the conflicting social interests and uneven power relations that specific 'modern' conceptions of technology and management imply (Robbins, [2004] 2012; Walker, 2005). I also critically engage with research focusing on the waste/value relationship, linearity and 'ongoingness' in economic activity (Bloch, 2013; Crang et al., 2013; Gidwani and Reddy, 2011; Gregson and Crang, 2010; Gregson et al., 2010; Lepawsky, 2015a; Lepawsky, 2012; Lepawsky and Billah, 2011; Lepawsky and Mather, 2011; Lepawsky and McNabb, 2010). Here, in accordance with Herod and colleagues (Herod et al., 2013; Herod et al., 2013a), I make the case for a greater use of approaches focusing on the labour process and thus push forward this research agenda.

VARIETIES OF CAPITALISM AND 'VARIEGATED CAPITALISM'

Economic geographers traditionally consider that uneven development is neither a temporary nor a marginal characteristic of capitalism, but rather a systematic expression of its inherent contradictions (Smith, 2008). Moreover, they conceive this dominant mode of production as an unstable system, rooted in environmental, cultural and social contexts that affect its variation in time and space (Sheppard, 2011). In contrast, most political economists understand geographical differences as temporary deviations. However, some heterodox scholars in this field consider economic and political variations as the outcome of historical choices (Hall and Soskice, 2001). From this latter group emerges the VoC literature. VoC scholars share, therefore, several theoretical and methodological similarities with the project pursued by economic geographers (Peck and Zhang, 2013). They share the same interest in heterodox economy and investigate institutions and their varieties across space. They examine diversity in economic formations and governance structures (Peck and Theodore, 2007). The VoC school focuses, therefore, on topics that have long been a central concern in economic geography. It is on this ground that Peck and Theodore (2007) advocate for a more engaged dialogue between the two literatures.

When the VoC research first arose in the nineties, it sounded as a dissonant voice in the debate dominated by proclamations of the end of history (Fukuyama, 1992; Ohmae, 1990). The communist alternative was declared defeated, the Soviet Union had collapsed and China was half way into its opening up and reform project. Market economy was considered the only possible way. The VoC school emerged as a reaction to this vision. A number of scholars started to observe that while capitalism was now the only actor on stage, different and contrasting interpretations of it were struggling for the leading role

(Streeck, 2010). According to Streeck (2010), this was most evident in the work of the French scholar Michel Albert, who anticipated and defined the central elements of the VoC framework. For Albert (1991), it was necessary to investigate the asymmetries between two competing varieties of capitalism, what he defined the classical neoliberal model of Anglo-American countries and the 'Rhinish' model of continental Europe. Albert (1991) portrayed the Anglo-American model as characterised by individualistic values and competitive working relations inside companies, which were considered as commodities. Conversely, the 'Rhinish' model was described as a system fostering egalitarian values, a high level of social redistribution, group interests and a community-oriented view of the firm. The position was stated clearly: the 'Rhinish' model was a superior system and it was the duty of European politicians to preserve it in the face of neoliberalisation attacks (Peck and Theodore, 2007). However, this was seen in Albert's conclusion as a difficult outcome, because it was, alas, more plausible that the pressure of 'modernization' would finally undermine the 'Rhinish' model of capitalism (Streeck, 2010).

Another scholar who played a major role in the early development of the VoC debate was David Soskice. His main influence was in framing the argument in the terms and from the perspective of the firm (Peck and Theodore, 2007). In contrast, with the abstract notion of a singular market rationality, Soskice (1997) highlighted how, in advanced capitalist systems, micro-agents, such as companies, customers, employers, and owners of capital, strategically adopt different and productive behaviours according to the production regimes within which they operate. The term production regimes, employed also by Hollingsworth et al. (1994) as a synonym of social systems of production, referred to the organisation of production through markets and market-related institutions. In other words, according to Soskice the particular institutional and

sociocultural contexts set the 'rules of the game' in which micro-agents organise their interrelations (Soskice, 1997). Within this picture, he noted that the most important institutions contributing to this framework were the financial system, the industrial relations system, the educational and training system, and the intercompany system. By scrutinising the configuration of these institutions across countries, Soskice (1997) attempted to explain the differences in micro behaviours. These included the acquisition of employees, the relations between managers and owners and between companies and suppliers, the production, development and innovation strategies, and so forth.

While the work of Soskice was mainly focused on an analysis of these differences at the national level, Hollingsworth and Boyer (1997) presented a new element in the debate: scale. In the introduction of the volume *Contemporary Capitalism*, the authors outlined four levels in which economic variation may occur: the global, the transnational, the national and the regional level. In this regard, the main question posed in the volume was whether the market mechanism would replace state coordination or whether alternative devices such as coordination by communities would emerge at the local level. The authors argued that the national scale would remain the main domain where production regimes could form. However, they also acknowledged that other scholars suggested the importance of regional economies. This was notably the case for the study on the rise of post-Fordist regimes (Piore and Sabel, 1984; Storper and Scott, 1992) in Third Italy (Becattini, 2000), in the valley of the Jura Mountains (Grossetti, 2004) or Baden-Wurttemberg (Hirst and Zeitlin, 1991).

As pointed out by Peck and Theodore (2007), in line with this perspective, several authors (Amable, 2003; Boyer, 2005; Crouch, 2005; Hay, 2004; Lorrain, 2005; Sorge, 2005; Thatcher, 2004; Yamamura and Streeck, 2003) explored variety, reaching diverse

conclusions in terms of how capitalisms differ. Boyer (2005) outlined how Regulation Theory defines at least four varieties of capitalism: the market-led, meso-corporatist, social democratic and state-led. Bruno Amable (2003) identified five different models of capitalism: the market-based, the social democratic, the Continental European, the Mediterranean, and the Asian model. Streeck (2010), in turn, distinguished between four models: the social embeddedness model, the power resource model, the historical-institutionalist model, and the rationalist-functionalist model. Differently, other authors, such as Thatcher (2004), pointed out how international pressure could affect national settings and, in turn result in cross-national convergence, reducing the diversity of national capitalisms[2].

Although some authors have investigated this agenda in diverse ways in recent years, Streeck (2010) demonstrates how the bulk of the literature is still nowadays highly influenced by the rationalist-functionalist analysis proposed, more than one decade ago, by Hall and Soskice (2001). This framework, in contrast with approaches that conceptualised 'institutions as sites for the exercise of power' (Peck and Theodore, 2007, p.743), focuses on the concept of *comparative institutional advantage*, and conceives institutions as components of a particular national structure, which provides, or lacks, advantages for the establishment of specific activities by firms (Hall and Soskice, 2001). From this standpoint, varieties are strictly confined to a linear axis, whose poles are Liberal Market Economies (LME), such as the United States, and Coordinated Market Economies (CME), such as Germany. Somewhere in between there are 'Mediterranean' state capitalisms, i.e. France or Italy, which do not comply with the analytical framework (Streeck, 2010). Hall and Soskice (2001) locate a relational view of the firm at the centre

[2] Thatcher analysed how factors, such as transnational technological and economic developments, overseas reform, and European regulation affected institutional reform in the case of telecommunication regulation in different countries.

of their analysis. They consider that the behaviour of micro-actors is finalised to develop and exploit *core competences* or *dynamic capabilities* through the interrelation of five spheres: industrial relations, vocational training and education, corporate governance, inter-firm relations, and employees. For the authors, firms face a number of coordination problems *vis-à-vis* the wide range of actors composing these domains (Hall and Soskice, 2001). Therefore, the comparative analysis of how firms resolve their coordination problems is used, in this approach, to define the character of national economies.

The VoC framework has been particularly productive in calling into question conventional views of globalisation, as well as challenging the singular conception of market rationality (Peck and Theodore, 2007), and is therefore a potent tool to criticise neoclassical economics and neoliberalism (Lü, 2010). However, scholars have addressed a number of criticisms relating to this framework. These have particularly focused on its rigid bipolar notion of the global economy, its mono-scalar national focus, its inherent functionalism and economicism, as well as its lack of historical analysis of the development of LMEs and CMEs (Peck and Theodore, 2007). These shortcomings are particularly evident in the rare applications of the VoC framework to China (Peck and Zhang, 2013). In this regard, the divergent analyses of Witt (2010) and Fligstein and Zhang (2011) are a sparkling example. For Witt (2010), China does not perfectly fit either the LME or the CME type. However, he finds that there is a closer resemblance with the former. According to his analysis, this is particularly true for the internal structure of firms, which tend to exacerbate the tendency, typical in LMEs, of top-down decision-making. Likewise, the author finds evidence of resemblance to LMEs in the industrial, the education and training and the inter-company relation systems, underlining, on the contrary, how the financial system is a case *sui generis* (Witt, 2010).

In contrast to the analysis above, Fligstein and Zhang (2011) find that Chinese capitalism greatly resembles the French *dirigisme* model, and not so much the liberal market American standard or the coordinated German economy. While the authors recognise that the political difference makes China and France in many ways incomparable, they nevertheless suggest that a number of elements make them significantly similar. They argue that labour in France is less organised than in other developed countries and that the government is the real mediator of industrial relations. This should somehow mirror the Chinese situation, where the All China Federation of Trade Unions (ACFTU), which covers almost half of the working force (Peck and Zhang, 2013), is more realistically considered as a state organ than a union (Lee et al., 2011; Taylor and Li, 2007; Witt, 2010). They also point out that in France, as in China, the larger employer is the public sector, that the biggest companies are state-owned in both countries, and that both governments control key national industries. However, the authors subsequently highlight three major differences: the political system, the role of the state in the economy, and the bargaining power of labour. These facts, however, do not inspire them to reconsider their evaluation. Nevertheless, what it is particularly interesting in the paper by Fligstein and Zhang (2011) is that, although they remain loyal to the VoC framework, they introduce many elements to move beyond it. Indeed, they draw a clear picture of the main views on Chinese capitalism, which deserves a closer look. I analyse these in the next paragraphs.

Fligstein and Zhang (2011) focus their attention on two main aspects of the debate on Chinese economy: the role of the state and the role of the entrepreneurial class. The authors create a typology of alternative views on the factors that explain economic growth and simultaneously are detrimental to it. They point out that economists are generally doubtful towards the involvement of the state in the economy as well as being

sceptical of any positive function of *guanxi* (关系, social networks) in fostering economic growth or unleashing entrepreneurial activity. To these purposes, they consider more effective price signals, clearer property rights and a minimum state intervention (Naughton, 1996; Nee, 1989; Nee et al., 2007; Tian, 2001). In contrast, they estimate that a second group of scholars positively assess both the involvement in the economy of the Chinese government, and the role of social networks. According to the authors, a first subset of works shows that the Chinese government has created positive conditions for development (Oi, 1992; So, 2003; Wang, 2009) both nationally and locally (Li and Zhou, 2005; Montinola et al., 1995; Weingast, 1995), while a second subset of research focusing on *guanxi* highlights their role in filling institutional voids, in positively alleviating the barriers of the old command system, and in transmitting information (Boisot and Child, 1999; Krug and Hendrischke, 2008; Wank, 2001; Zhou, 1996).

Fligstein and Zhang (2011) conclude that this proliferation of views, based on empirical studies, lacks systematic theoretical thinking. They write:

> 'like many debates in social science, partisans of one scenario over another disregard alternative evidence and continue to act as if their explanation of Chinese economic growth were sufficient to account for what is occurring.' (p.47).

and they add:

> 'we need to invoke other theoretical perspectives or a grand conceptual framework to develop a more coherent understanding of the complexity of Chinese capitalism. Such a theoretical perspective should take into account that every transition to capitalism has produced a new variety of capitalism, and in each transition, a set of common problems have had to be resolved.' (p.47).

Fligstein and Zhang (2011) understand that this situation does not describe what 'might be going on in China' (p.41) and that there is a need to push forward the theoretical and conceptual agenda. However, in following the VoC orthodoxy, they remain trapped in precooked categories and finally do not succeed in providing a conceptual framework to understanding Chinese capitalism. While Fligstein and Zhang (2011) fail to move beyond VoC, this will be successfully achieved by Peck and Zhang (2013). Peck and Zhang (2013) start their analysis with a comparison between the VoC framework and the 'Chinese model'. After pointing out the insufficiency of conventional VoC caveats to rationalise the nature of Chinese capitalism, the authors note that some scholars have even left open the question of whether China's transformation will lead to new forms of socialism, as opposed to capitalism (Arrighi, 2007). However, they argue that this idea represents a minor view, as the literature on China tends to apprehend this transformation as a process leading to capitalism, counting at least 17 contending labels to define it (Baum and Shevchenko, 1999).

Peck and Zhang (2013) thus move to review this vast production around three major thematic dichotomies: market socialism/state capitalism, social developmental state/state neoliberalism, and *guanxi* transnationalism/power-elite capitalism. The authors argue that the Chinese transformation has been the result of an interparty struggle between two different visions of the opening up of the country. Following Fewsmith (2008) and Saich ([2001] 2010), they draw a brief historical vignette of the Chinese left-right political struggle, which led to the development of the Chinese 'socialist market economy'. On the one hand, leftist leaders apprehended economic reforms only in the wider frame of the socialist ideology and planned economy. This was summarized in the metaphor of the 'birdcage economy' (鸟笼经济 or 鸟笼理论) of Chen Yun (陈云, 1905 – 1995). On the other hand, rightists pushed for major liberalisations both in the economic and political

domains. The leading symbol of this perspective was the reformist leader Zhao Ziyang (赵紫阳, 1919 – 2005).

As correctly pointed out by the authors, the concept of 'socialist market economy' has been constructed as the result of a dialectic movement between these different forces. This struggle found a synthesis in Deng Xiaoping and in moderate figures such as Qiao Shi (乔石 born in 1924) and Li Ruihuan[3] (李瑞环, born in 1934) (Fewsmith, 2008). Deng, the chief architect, insisted on a middle way, alternatively evoking the 'reform and opening up' or the 'four cardinal principles' while confronting leftists or rightists (Peck and Zhang, 2013). While Deng was critical towards the path that URSS had taken under the leadership of Gorbachev, he was also conscious that the Chinese Communist Party (CCP) had to satisfy the aspirations of the people, or socialism would have been undermined in China as it was in Russia (Saich, 2010). However, the Tiananmen incident in 1989 and the resulting dismissal of Zhao Ziyang, cleared the way for a few years of strong leftist guidance (Saich, 2010). A severe critique was thus addressed to economic reforms and the new leadership under Li Peng imposed austerity measures. This, however, did not last long. The Southern tour of Deng Xiaoping in the special economic zones (SEZ) served to reaffirm that the legitimacy of the party was rooted in the success of economic reforms (Saich, 2010). A few months later, the Fourteenth Party Congress in 1992 consecrated this view, through the formula of 'socialist market economy'. From Deng's perspective, the 'commodity economy' does not necessarily lead to capitalism (Peck and Zhang, 2013). The market was a complement for the planned economy and it would be subordinated to the logic of the socialist state. A new season of reforms started and a different 'clique' of leaders came to power (Bergère, 2002).

[3] The historical 'carpenter', major and party secretary of Tianjin, elected to the political bureau together with Jiang Zemin, in 1989, and promoted to the PCC standing committee in 1992.

Peck and Zhang (2013) argue that the peculiar combination of socialism and capitalism in China is the product of a double movement (Polanyi, 1944), which is simultaneously contradictory and complementary. Therefore, Chinese reforms should not be conceived as a linear path. Indeed, the legacy of socialism is still particularly clear nowadays in three main domains: the ambiguous property rights system, the strong presence of the state in the market, and the advance of capitalist class interests (Peck and Zhang, 2013). An example of this hybrid and contradictory system is the relationship between the government and state-owned enterprises (SOEs). In recent years, these companies have integrated global financial networks, becoming unusual 'capitalist tools in socialist hands' (Wójcik and Camilleri, 2015, p.464). The connection between the state and enterprises is intermediated by the *State-Owned Assets Supervision and Administration Commission* (SASAC), and defined by two factors: an extensive hierarchy and a complex network of relationships (Lin and Milhaupt, 2012). This research has thus highlighted how the peculiar relationship between the state and the economy reveals important facets of the variegated mode of Chinese capitalism. However, research has so far mainly focused on formal dimensions of the economy. Here, I suggest that studying informality, and therefore invisible economic activities, is a powerful tool to complement this enterprise and to push forward our knowledge in economic geography.

Contradictions also puzzle China's industrial relations and labour market (Peck and Zhang, 2013). On the one hand, the ACFTU acts as the only official labour union and spontaneous forms of mobilisation are absorbed under its umbrella. On the other hand, the labour market remains divided by the *hukou* regime[4] (Fan, 2011). While the floating population constitutes the major workforce of the urban economy (Huang, 2009; Mitter, 2008), it is at the same time a vulnerable population suffering workplace exploitation and

[4] The household registration system.

social discrimination (Peck and Zhang, 2013). The division of the labour market and the emergence of a floating population are connected to another central theme of contemporary capitalism in China: the commodification of space. While land is often requisitioned for the construction of industrial parks, enterprise zones or new urban projects (Peck and Zhang, 2013) in a process of primitive accumulation, peasantry in the countryside and migrant workers in urban villages are recurrently dispossessed from their means of production (Peck and Zhang, 2013; Webber, 2008). Informal activities established in the rural-urban fringe of metropolises are subjected, as we will see in this research, to recurrent relocation (Tao et al., 2014), while land becomes a main object for the politics of accumulation. As I argue in this thesis, invisibility represents a useful concept to describe and analyse this phenomenon as well as analyse the agency of informal workers, the characteristics of the space where their economic activities are pursued, and the uneven power relations embedded in the urban space. As pointed out by Hsing (2010), while capitalist pressure implies a rising commodification of space, different forces contribute to the production of space (Harvey, 1985; Lefebvre, [1968] 2009; Lefebvre, [1974] 1991) as well as to the growth of conflicts in the struggle for its control (Katznelson, 1992). As Hsing (2010) points out, urban projects serve as indicators of the 'modernity' of a territory and thus measure the achievement of local administrations. As a result, cities' identities are forged around spectacular projects, which bring about important ideological effects in legitimising local leaders, who, through urban regeneration, continuously renovate their authority, which is both undermined and boosted by the marketization process (Davis, 2000).

Following on from this perspective, research has examined many bridges between the economic transformation of China and its urbanisation process, investigating subjects such as the dismantling of people's communes, the resulting growing rural revenues, the

emergence of a rural workforce surplus, and their effects on the formation of new urban forms (Sanjuan, 2000). For instance, the establishment of towns and villages enterprises (TVEs) has been an object of study in the West (Wei, 2003) and in China. Guldin (1992), as well as Shang (2004), has highlighted the role of small towns and villages in the urbanisation and industrialisation of China, outlining how this shift has contributed to the definition of new social relationships. Harvey (2007) understands this phenomenon as a movement towards a neoliberal structure. According to this scholar, local administrations, liberated by the control of a central authority, became through the establishment of TVEs, centres of entrepreneurialism, flexible labour practices, and open market competition. However, challenging Harvey's standpoint, Nonini (2008) gives a divergent interpretation of Chinese economic reforms. Research has also tried to understand to what extent the coexistence of private initiatives and authoritarian rule (Zhang and Ong, 2008) leads to unforeseen patterns in which elements of neoliberal practices and socialist dogmas merge in a new system that scholars have in turn called neo-socialism (Pieke, 2009), sino-capitalism, *guanxi* capitalism (McNally, 2008; Tsai, 2002; Yeung, 2004), capi-communism (Napoleoni, 2010) and so forth. While some authors have called attention to some of its 'more pertinent dimensions' (Zhang and Peck, 2014, p.22), investigating its multi-polar and multi-scalar complexity is still a project *in fieri*. This thesis aims to participate in this effort by trying to unlock some of the dimensions of the Chinese mode of capitalism, through the study of the informal economy and waste recycling in Beijing.

INFORMAL ECONOMY

Since its early development in the 1970s, literature on the informal economy has been animated by lively debates (Chen, 2012). At the time, scholarship was particularly concerned by the theoretical controversy of defining informality, its boundaries and functions (Meagher, 2013). Chen (2012) identifies four different approaches in the literature: the *dualist* that understands informal economy as a net providing income for the poor (Hart, 1973; ILO, 1972; Sethuraman, 1981; Sethuraman, 1976; Tokman, 1978); the *structuralist* that conceives informality as petty commodity production subordinated to the capitalist economy (Castells and Portes, 1989; Moser, 1978), acting as a means to reduce input and labour costs for formal firms; and the *legalist* (De Soto, 2000; De Soto, 1989) and *voluntarist* (Maloney, 2004) that argue that informal entrepreneurism operate in such a way to avoid unnecessary costs of formal regulation (Chen, 2012). However, a generally accepted definition was adopted in the literature already by the end of the 1980s (Meagher, 2013). This described informality as 'income generating activities that operate outside the regulatory framework of the state (Castells and Portes, 1989; De Soto, 1989; Feige, 1990; Harding and Jenkins, 1989)' (Meagher, 2013, p.2).

Interestingly, recent literature, building on 1970s and 1980s research, has revived this debate and proposed new definitions (Meagher, 2013). Some of these have described informal activities as the division, content, negation and residue of formal economy (Guha-Khasnobis et al., 2006). From this perspective, as pointed out by Hart (2006), one of the first scholars to use the concept of informality for his study in Ghana (Hart, 1973), formal and informal sectors appear to be separated because of the term 'sector' , which gives the impression that they are distinct entities (Hart, 2006). Guha-Khasnobis et al. (2006), building on Lipton (1984), pointed out that this approach has led to at least 'three

alleged deficiencies: misplaced dualism, misplaced isolation and confusion' (p.3). In contrast, they also notice that other studies describe informality as a 'grey area' (Guha-Khasnobis et al. 2006). From this second perspective the formal-informal divide represents a continuum with no clear boundaries (Guha-Khasnobis et al., 2006). Informal and formal economies are thus conceived as a range of activities, the former being mostly outside the reach of official governance and the latter primarily inside its mechanisms (Guha-Khasnobis et al. 2006). Some activities break the law, evade taxation, and operate without licences. However, this does not always imply illegality. They may be tolerated or even promoted by governments as a way to control social conflicts (Briassoulis, 1999). Moreover, this does not imply disorder. Conversely, research has shown that informal economy can reach a high level of social and economic organisation (Béja et al., 1999; Li et al., 2012; Li et al., 2012a; Tang and Feng, 2000; Tang and Feng, 2002; Xiang, 2005; Xiang, 2000).

It could be argued, translating Marcuse's argument on the city (Marcuse, 2005), that the term informality itself represents a perverse metaphor. Its use can obscure the diversity of existing conflicts and interest groups that compose and are in relation with the informal economy. However, as Ma (2006) correctly argued in relation to Marcuse's criticism, metaphors are still valid tools and discarding them would imply 'throwing out the baby with the bath water' (Ma, 2006, p. 377). Consequently, while I understand that definitions of formality and informality are often contested and socially constructed (Schindler, 2013), in this research, I will use these terms, for I believe they are still valuable concepts. I will thus refer to informality using the definitions proposed by Kate Meagher (2013). The scholar, building on the ILO (International Labour Organisation) and WEIGO (Women in Informal Employment Globalizing and Organizing) classification, and on the work of Helmke and Levitsky (2004), defines five central

concepts: the *informal sector* or 'the production and employment in unregistered enterprises'; the *informal employment* or 'the employment outside of the labour protection regulations of a given society, whether in formal or informal firms'; the *informal economy* or 'all firms, workers, and activities that operate outside the legal regulatory framework of society, and the output that they generate'; the *informal institutions* or the regulatory arrangements 'outside of official sanctioned channels'; and the *informal markets* or the 'organisational arena in which informal economies operate, where labour, goods and services are traded' (Meagher, 2013, p.2).

As pointed out by Kate Meagher, informality raises important questions, which reflect the increase in interest in the field more generally. This attention has resurfaced over recent years in response to the dramatic expansion of the informal economy in the face of global economic crises, both in developing and developed countries (Meagher, 2013). The burgeoning literature relating to the subject reflects the increased recognition of the relations 'between informality and growth on the one hand and the links between informality, poverty, and inequality on the other' (Chen, 2012a, p.3). As Chan pointed out, the informal economy contributes to the overall economy and is strictly linked to formal activities (Chen et al., 2005; Chen, 2012a; Chen et al., 2004).

As a result, in recent years the topic of formal-informal linkages has been one of the most studied in the field. I will follow Meagher (2013) to outline the main themes in this literature and integrate her literature review with main works focusing on China. She identifies four major perspectives, which she classifies as (a) mapping economic linkages, (b) linkages as mechanisms of institutional design, (c) linkages and governance transformations, and (d) politics of linkages. I describe these subsections in the following paragraphs.

The first theme (a) focuses on "linkages as connections through which resources, including finance, inputs, labour, information, and outputs flow between the formal and informal economies" (p.5). The author divides the literature in four subthemes: interfirm linkages (Arimah, 2001; Meagher, 1995; Pieters et al., 2010; Ranis and Stewart, 1999), labour markets (Guha-Khasnobis and Kanbur, 2006; Perry, 2007), financial markets (Sagrario Floro and Ray, 1997), and global value chains (GVCs) (Brooks, 2013; Crang et al., 2013; Kirby and Lora-Wainwright, 2015; Kirby and Lora-Wainwright, 2015; Lepawsky, 2015a; Lepawsky and Billah, 2011; Lepawsky and Mather, 2011; Lepawsky and McNabb, 2010; Tong and Wang, 2004). While early works adopted a national focus, recent research has taken into more consideration the impact of global production networks. This has brought about a number of changes both in theory and in policy approaches. Kate Meagher (2013) suggests, firstly, that in the context of liberalisation and globalisation, market linkages are understood not only as means of development but also as mechanisms of exploitation. Secondly, she argues that while focusing on the technical upgrading of informal firms, research has shifted towards themes relating to poverty alleviation and social protection. Thirdly, she points out that promoting informal organisations has become more popular in the literature. Finally, she contends that the focus on the role of formal private actors as promoters of linkages is increasingly replacing the focus on the state.

A second direction of the literature sees linkages as (b) mechanisms for filling institutional gaps from state and market failures, and thus as instruments of design to facilitate complementarities (Meagher, 2013). This strand focuses on the co-production and provision of public services and goods, such as in the case of solid waste management (Chi et al., 2011; Wang et al., 2012). In this regard, the author points out that a more critical branch, focusing on labour, outlines the effect of linkages, between

formal and informal spheres of the economy, as mechanisms to exploit the 'bottom of the pyramid' and means to restructure networks around the interest of corporate profit and global capital (Cross and Street, 2009).

Rather than looking at linkages from the policy perspective of (b) institutional design, the third strand of the literature on (c) governance investigates the institutional process. Therefore, it focuses on power as well as on the allocation of benefits across the formal-informal divide (Meagher, 2013). Research in this field has investigated the spread of informal institutions into formal processes of governance (Cleaver, 2002) as well as their role in state-building (Evans, 1996). This literature draws upon concepts of bricolage, hybrid governance, and synergy (Meagher, 2013). It recognises that linkages contribute to shift formal responsibilities and provide greater regulatory power to informal actors, sometimes with new outcomes as the result of the evolution of socially embedded configurations (Meagher, 2013).

Finally, the literature on (d) the politics of linkages looks at relationships across the formal-informal divide as sites of struggle (Meagher, 2013). Critical research dominates this debate. While political scientists have mainly described and analysed labour organisations and social movements (Lindell, 2010), geographers have principally investigated restructuring in governance structures and outlined that, in the context of neoliberalism, these changes represent moments of struggles (Miraftab, 2009; Miraftab, 2004; Mosiane, 2011; Watson, 2009). For instance, drawing on the poststructuralist idea of governmentality (Foucault, 2004; Hobson, 2010; Hobson, 2013), Watson (2009) notes that 'clashes of rationalities' (Watson, 2009, p.2259) arise between techno-managerial administrations and informal labour.

Two of the most important works on China, engaging with these literatures, are the books on the *Zhejiangcun* (literally, Zhejiang village) by Xiang Biao and Zhang Li. In the introduction I engaged with the research by Zhang (2001), and here I mainly present the work by Xiang Biao. This work, originally published in Chinese (Xiang, 2000) and then translated to English (Xiang, 2005), is a historical account of the interaction and tensions between a migrant community and the state. A product of six years of ethnographic research, *Transcending Boundaries* (Xiang, 2005; Xiang, 2000) describes and analyses the establishment and struggle of a rural migrant community who moved from Wenzhou prefecture in Zhejiang province to Beijing in the early 1980s. From the original establishment of six peasant families in Nanyuan township, five kilometres south of Tian'anmen, the Zhejiangcun became home to nearly 100,000 migrants at the end of the nineties. 'Armed with little more than perseverance and ingenuity' (p.3), a marginalised and stigmatised rural population created the largest supply centre for low to medium priced clothes for the whole of north and northeast China, which comprised, by the end of 1994, no less than 16 large wholesale marketplaces (Xiang, 2005).

Xiang (2005) notes that Wenzhou migrants, transcending geographical, social, administrative and ideological boundaries, established and developed successful economic activities. Official discourse promoted a certain vision of 'modernity', a 'modern market system' and 'advanced society', whilst at the same time stigmatising the migrant population as low *suzhi* people (素质, quality of person). The author points out, in contrast, that the creativity of this entrepreneurial population should be regarded as a source of lessons for the entire China. Moreover, this case demonstrates that the emergence of a market system in China implies a redefinition of the relationship between state and society, which has important social and political implications (Xiang, 2005). In the author's preface to the English version of the book, Xiang Biao remarks that, since

the publication of the original manuscript in 1998, much has changed in China. In the early 2000s, a relaxation of the *hukou* policy allowed smaller towns and cities to issue the urban *hukou*. However, the author believes that tensions between the urban society and newcomers may even escalate with a deeper reform of the *hukou* system[5]. While the *hukou* system has not yet prevented inner migration, the real tension is rooted, according to the author, in the distribution of political power and responsibility within the Chinese state (Xiang, 2005).

As pointed out by the author, in a superb example of intellectual honesty, the original work in fact had some major limitations. Xiang (2005) notes that the book lacks of gender perspective, since not much voice was given to the experience of women. Secondly, the author adopted an implicit *laissez-faire* perspective, which turned a blind eye to the inner struggles of Zhejiangcun. As a consequence of this, *Transcending Boundaries* does not provide appropriate information on the production process. In other words, while the principal focus was on the struggle between the migrant community and the state, not much attention was given to the relationship between capital and labour in the migrant community. As a result, little is said about how workers were organised and controlled, while creating value and objectifying their labour. Nevertheless, *Transcending Boundaries* remains a source of great inspiration and it represents the first mile of my intellectual journey. It is, thus, the aim of my thesis to push forward its research agenda. In doing so, I will study the production processes of what I call Local Inform Systems (LIS) in the domain of waste recycling in Beijing, and involve, in my analysis, different traditions of economic geography, notably flexible specialization, neo-Marxian, and neo-Polanyian schools.

[5] In December 2014 the State Council published a proposition for the reform of the *hukou* system in small and medium townships. However, substantial restrictions remain unchanged for megacities (cities with more than 5 million people). See State Council (2015).

Two other sets of works are particularly important for my research. The first set of works was produced between the end of the 1990s and the beginning of the 2000s by two Chinese researchers, Feng Xiaoshuang and Tang Can, and two French academics, Jean-Philippe Béja and Michel Bonin (Béja et al., 1999). In two papers published in Chinese (Tang and Feng, 2000; Tang and Feng, 2002) and one in French (Béja et al., 1999), this group of scholars described and analysed a migrant community of informal recyclers established in the northern rural-urban fringe of Beijing that they called, building on works by Xiang (2000) and Shi (1992), the *Henancun* or the *Village du Henan* (the Henan village). Being almost entirely populated by migrant workers from Gushi prefecture in Henan province, the community was the largest concentration of informal recyclers in Beijing at the time (Béja et al., 1999; Tang and Feng, 2000; Tang and Feng, 2002). In contrast with the Wenzhou 'entrepreneur migrants' (Béja et al., 1999), people from Gushi came to Beijing without any capital or technology (Tang and Feng, 2000). However, over the course of a few years, they rapidly differentiated and stratified their economic system in a sophisticated division of labour, which brought about the emergence of a complex socio-economic structure (Béja et al., 1999; Tang and Feng, 2000).

These works represent a valuable source of relevant insights into the division of labour and the emergence of different social groups in the migrant community. The scholars make an original analysis of the distribution of power and capital. However, their study does not further investigate how this socio-cultural stratification is both a product and an inner mechanism of the economic system of what they call the *Henan village*. Although the authors describe, through the accounts of their interviewees, how social status, identities, and values evolved over a decade, their economic analysis remains essentially static. While the work gives relevant insights into individual careers, spanning success

and failure, little is said about the adventure of the community as a whole. How did the economic system change over two decades? Which socio-economic mechanisms lay at the base of this migrant community? What made this economic system, besides the obvious aspiration and determination of its individual members, particularly competitive?

Moreover, the authors note that the *Henancun* was not the first of his kind, but rather the reestablishment, in the area of Bajia, of the former village of Erlizhuan, demolished due to Beijing's new urban planning policies. However, not much is said about the relationship between the socio-economic development of the community and Beijing's urbanisation process. While the authors pay little attention to this point, the relationship between urbanisation and informal economy, as pointed out by Tao et al. (2014) and Mitchell (2009), is indeed a major one. Firstly, I hope to show, in this thesis, that this relationship highlights differences between two coexistent and conflicting modes of capitalism: the first founded on accumulation by dispossession, the commodification of space and the urbanisation of capital (Hsing, 2010; Webber, 2008); the second merely based on the production of petty commodities by small and medium enterprises. Secondly, it explains how major changes occurred in the community and how capital became increasingly concentrated in the hands of successful individuals. As I will attempt to outline, the continuous relocation of these activities, from their early appearance in the 1980s to present day, dictated successive waves of investment and innovation, through a process of imposed creative destructions (Schumpeter, [1942] 2010), resulting in the success and failure of many. While highlighting these phenomena in Chapter 5 and 6, I construct and mobilise the concept of invisibility to analyse the production of space and the relationship between structures and agency in the informal economy.

The second set of studies, to which I pay particular attention in my research, has been produced by a larger group of scholars in more recent years. While Minter (2013) and Goldstein (2006) made a historical account of changes in the disposal and recycling of solid waste in Republican, Maoist, and Post-reform China, which will be presented in Chapter 3, a growing number of social scientists have been very active in investigating the political ecology of a particular segment of Chinese informal recycling: e-waste (electronic waste or WEEE – waste electrical and electronic equipment). This interest reflects the rapid growth of e-waste recycling in China that started in the early 1990s when local businesses specialised in material recovery and product refurbishment from imported e-waste (Tong et al., 2015; Tong and Wang, 2004). As pointed out by Tong et al. (2015), uncontrolled environmental pollution and poor worker protection in e-waste treatment received dramatic global exposure in 2002 when the Basel Action Network (BAN), together with the Silicon Valley Toxics Coalition (SVTC), released the report *Exporting harm: the high-tech trashing of Asia* (BAN, 2002). This resulted in increased attention to the subject of e-waste recycling by domestic as well as international scholars and policy circles.

While global pressure boosted the implementation of new policies and regulations (Tong et al., 2015), Chinese legislators, borrowing from European Union directives (Kama, 2015), introduced concepts of extended producer responsibility (EPR), reverse logistics, and circular economy in China (China RoHS, 2006; China WEEE, 2009; China WEEE Governmental Fund, 2012), in order to build, as scholars usually suggest, a system similar to the European model. However, I will try to show that the Chinese system eventually resulted in a very different model compared to the European one. In my opinion, rather than explaining a specific idea of the e-waste issue and of environmental management, this outcome unveils, more interestingly, how Chinese officials conceive the economy

and its regulation, and teaches us something about the peculiar relationship between the state and society in China. In any case, the promotion by the central government of a formal system for e-waste recycling also resulted in a growing tension between the newly built recycling system and the pre-existing informal activities. As Tong et al. (2015) note, new policies brought about the re-making of spaces of conversion, the introduction of a new division of labour, as well as the emergence of new linkages between formal and informal economy (Chi et al., 2011; Tong et al., 2015; Tong et al., 2004; Tong and Yan, 2013)

Not surprisingly, these changes have attracted the attention of both domestic and international scholars adopting a rich array of approaches. Borrowing from e-waste literature on developing and developed countries, a non-exhaustive list of these different perspectives includes: environmental toxicology and occupational health approaches (Huo et al. 2007; Leung et al. 2006; Leung et al. 2010; Wang 2005; Wong et al. 2007; Xijin Xu et al. 2012), concerned with the implications for people and the environment, and associated with specific modes of recycling (Li et al., 2008); management engineering perspectives, which investigate ways to manage the disposal of post-consumption products (Bahers, 2014); and geographical and anthropological studies, which engage with issues of social and environmental justice (Joines, 2012). Major themes in the academic debate have thus dealt with actors, policies, methods and structures of e-waste management (Bahers, 2014; Huisman, 2013; Lepawsky, 2012; Lifset et al., 2013), flows of e-waste (Hosoda, 2007; Lepawsky and McNabb, 2010; Terazono A, 2006), linearity and value (Crang et al., 2013; Lepawsky and Mather, 2011).

Works on e-waste management and on public policy dominate the literature (Pickren, 2014). This literature has investigated the issue both through a country-focused

standpoint (Chi et al., 2011) and a comparative perspective (Wang et al., 2010; Zeng et al., 2013). Valuable as they are, these works remain, however, inclined to hold to normative arguments when confronted with the informal economy. Here, a first group of scholars considers the Chinese informal recycling phenomenon as a problem and sees a desirable solution in the establishment of a formal system (Liu et al., 2006). Other researchers, adopting a more complex perspective on the role of the informal economy, promote the integration of efficient informal networks in the formal e-waste management system (Tong and Yan, 2013). For instance, Yu et al. (2010) define it as a spontaneous force of the market and, instead of representing this phenomenon only as a problem, also attribute positive functions to it. Moreover, Chi et al. (2014) suggest to integrate efficient informal actors into accountable and regulated e-waste management systems.

From a different perspective, critical geographers have inspired research on politics of e-waste (Kirby and Lora-Wainwright, 2015; Kirby and Lora-Wainwright, 2015; Lora-Wainwright, 2016). Lora-Wainwright underlines how modernist narratives that call for a straightforward transition to formal systems, promoting concepts of ecological civilization, circular economy and scientific development, are theological and evolutionary, and, as a result, obscure the role played by informal actors as an engine of economic development (Lora-Wainwright, 2016). Building on these studies, Tong and Tao (2016) remark that the definition of waste in general, and of e-waste in particular, is often limited and partial. It does not take into account the inextricable mix of social, environmental and economic attributes of materials. While mainstream narratives often focus on environmental and resource protection, they tend to ignore the existence of conflicting values, related to waste and recycling, of different actors and decision makers. Therefore, they are inclined to neglect the variety of interests involved and, as a result,

weaker groups working in the industry are often marginalised, segregated and excluded from local citizenship (Tao et al., 2014). In these accounts, waste is understood not only as a technical and ecological problem to be managed, but also as an element deeply rooted in the dimensions of space and time (Lora-Wainwright, 2016). Indeed, this acknowledgment suggests an investigation of waste in relation to 'its political other of capitalist "value"' (Gidwani and Reddy, 2011 p.1625). This will be the content of the third and last part of the literature review.

GEOGRAPHIES OF WASTE

In recent years, cultural geography has witnessed an upsurge of literature in new geographies of waste (Moore, 2012). As Moore (2012) pointed out, this research draws on a large variety of concepts which define waste as a hazard (Bowen et al., 1995; Liu et al., 2009), a resource (Alexander and Reno, 2012; Gutberlet, 2012a; Huysman, 1994; Li et al., 2012a; Reno, 2009; Schluep et al., 2009; Wang et al., 2012), a non-Marxian commodity (Berglund and Söderholm, 2003; Joines, 2012; Mitchell, 2009), a manageable object (Chi et al., 2011; Davies, 2008; Li et al., 2006; Li et al., 2012; Tong, 2004; Tong et al., 2013; Tong et al., 2015; Tong et al., 2004; Tong and Wang, 2004; Tong and Yan, 2013; Wang et al., 2013; Yu et al., 2010; Zeng et al., 2013), an archive (Rathje and Murphy, 2001), a matter out of place (Douglas, [1966] 2002; Moore, 2009), a filth (Hawkins and Muecke, 2002; Lhuilier, 2005), a risk (Davis, 2005; Kirby, 2011), a fetish (Gregson and Crang, 2010), a governable object (Laporte, [1978] 2000; Melosi, 2000), an actant (Gregson and Crang, 2010), and an abject (Moore, 2009; Moore, 2008). This diverse and vital literature has investigated waste, building on different approaches in

critical geography, anthropology as well as other branches of social science, trying to answer one central question: what is waste?

Interrogating waste, rather than being a mere theoretical exercise, has important political implications which challenge 'the modernist shibboleths of cleanliness, hygiene, and sanitation, and the often unjust and highly exclusionary sociospatial orders produced through them' (Moore, 2012, p.781). In other words, studying 'how, why and to whom waste matters (Gregson and Crang, 2010)' (Moore, 2012, p.781) means to investigate the reality of this peculiar kind of matter (Braun and Whatmore, 2010), from the people that deal with waste to the social relations in which it is involved (Moore, 2012). In this sense, waste represents a critical entry to understanding contemporary society (Hawkins, 2006; Hawkins, 2009). While Gregson and Crang show that definitions of waste are always contingent and may vary in time and space (Gregson and Crang, 2010), Moore (2012) outlines how these definitions can both be classified positively and negatively. While in the former case waste is defined through its essential qualities, i.e. hazard or a resource, in the latter, waste is characterised by its sociocultural relativity, i.e. matter out of place and disorder (Moore, 2012).

At the same time, waste can also be defined through its relationship with society. Moore (2012) points out that this rapport is both dualist and relational. While in the former case, waste is conceived as separated from society, i.e. as an externality of social processes, such as production or consumption, in the latter case waste is comprehended as a constitutive and immanent part of it. Moore concludes that, instead of being mutually exclusive, different definitions of waste serve to 'disturb certain taken-for-granted ideas about value, politics, and the sociospatial order more generally' (Moore, 2012, p. 793) and thus have the potential to engage with the politics of things. Therefore, the scholar,

building on Žižek (2004), proposes to think about waste as a *parallax object*. In Žižek's (2004) words, a *parallax object* eludes positive descriptions, asserts its antinomy as irreducible, and is characterised by the recurrent and multiple confrontations 'of two closely linked perspectives between which no neutral common ground is possible' (Žižek, 2006, p.4). Together with Moore (2012) I believe that conceiving waste through its contradictions, i.e. as waste and value, as bearer of risk and profit, and so forth, will succeed in 'opening up its political potential' (Moore, 2012, p.781) in innovative ways.

In what follows, instead of giving a broad-brush summary of the literature on geographies of waste[6], I outline one major antinomy, which will play a central role in my thesis. This is the relationship between waste and value. Literature focusing on this issue has been particularly productive in examining the afterlives of waste and the 'ongoingness' of economic life (Bloch, 2013; Crang et al., 2013; Gidwani and Reddy, 2011; Gregson and Crang, 2010; Gregson et al., 2010; Gregson et al., 2012; Lepawsky, 2015a; Lepawsky, 2012; Lepawsky and Billah, 2011; Lepawsky and Mather, 2011; Lepawsky and McNabb, 2010), giving rise to lively debates. Different perspectives have emerged in the scholarship. The performativity approach, based on actor network theory (ANT) (Latour, 2005; Law and Hassard, 1999), took up the majority of the debate (Herod et al., 2013a), and became, in recent years, the dominant paradigm in the field (Gille, 2010; Gille, 2007; Gregson and Crang, 2010; Lepawsky and Mather, 2011).

Josh Lepawsky is the leading figure of this perspective. In his research, the Canadian scholar builds on the notions of materiality, as usually conceived in science and technology studies (Çalışkan and Callon, 2009; Latour, 2005; Law, 2010; MacKenzie,

[6] For a critical assessment of the literature see Gregson, N. and M. Crang (2010), Moore, Sarah A. (2012), and Pickren, Graham (2014).

2006), and performativity, as defined by Callon (2006) (Lepawsky and Mather, 2013). Lepawsky's research has extensively focused on the waste-value relationship, the concept of linearity, and on commodity/value chains (Lepawsky and Billah, 2011). In different papers, the author has tried to rethink theoretical assumptions of Global Value Chain (GVC) and Global Production Network (GPN) frameworks in light of his empirical findings. According to Lepawsky, linearity not only simplifies economic activity, but also removes it from spatial and social contexts in which waste is embedded (Lepawsky and Mather, 2011).

In a journal article co-authored with Charles Mather, Lepawsky followed end-of life commodities in Bangladesh and Canada (Lepawsky and Mather, 2011). The authors went into the field in search of waste and endpoints of economic activity, but they could not find any. Instead, they found value, which was captured and created through the action of making and unmaking in what the authors define as production sites (Lepawsky and Mather, 2011). Therefore, Lepawsky and Mather (2011) came to the conclusion that endpoints of economic activities are always arbitrary and they suggested that boundaries and edges of waste can only be found by focusing on actions of wast*ing* and valu*ing* (Lepawsky and Mather, 2011). According to the two scholars, edges and boundaries can thus be recognised as effects of material transformations that things undergo, when, for instance, waste is transformed into 'cash… or jewellery… or gifts… or love' (Lepawsky and Mather, 2011). Due to this change, waste reaches its boundary, because the researcher, together with the network of subjects and objects that participate in the 'shaping of entities' (Callon, 2006), brings its reality into existence (Lepawsky and Mather, 2013). According to Herod and colleagues, Gregson et al. (2010) also adopt a similar perspective (Herod et al., 2013), when they critically engage with research inspired by the call of Appadurai (1986) to 'follow the things'. Gregson and colleagues argue that

geographical literature, inspired by this call, has principally focused on flows of 'stable objects' from developing to developed countries. To push forward the research agenda, they therefore decided to analyse the dismantling of end-of-life ships, which are transformed and revalued into furniture bought by the middle class in Bangladesh (Gregson et al., 2010). In doing so, they challenge commonly-held ideas in GVC and Global Commodities Chain (GCC) frameworks, and conclude that there is a need to 'rethink the thing' beyond these approaches. From their perspective, things are partially stable, and they can endlessly be transformed into something else.

These works are certainly helpful in pushing forward the research agenda in geography, in rethinking economic activity and moving beyond the notion of linearity. Moreover, these studies produced major contributions towards understanding symbolic aspects of waste (Herod et al., 2013a), which are usually ignored in other accounts. However, they are not without some shortcomings. As pointed out by Herod et al. (2013a), the performativity stance is inadequate to analyse the nature of waste under capitalism, because it separates the contingent and concrete economic reality from its capitalist form (Roberts, 2012). Herod et al. (2013a) demonstrate that the perspective above is not satisfactory, at least, for two reasons. Firstly, it does not take into account the labour process and the pursuit of surplus-value under capitalism enough. Secondly, while focusing on the physical transformation of materials, described in Marxian terms as the physical metamorphosis (Marx, [1867] 1976), they lose 'sight of the nature of commodities and waste under capitalism' (Herod et al., 2013a, p.377) and they confuse, I believe, use-value for value (Marx, [1867] 1976). Herod et al. (2013a) furthermore point out that research using a performativity approach often adopts an idealistic stance. It ignores that matter has a real ending and boundaries, given by its physical qualities of commodities and by the nature of capitalism. The authors point out that some materials,

such as paper or plastics, cannot be endlessly reprocessed, and others, i.e. glass bottles[7], are not recycled because little or no surplus-value can be created through them (Herod et al., 2013a). Moreover, in recognising in the physical transformations of matter the boundary between waste and value, the performativity approach ultimately "fetishises commodities and their constituent elements by focusing on their material form" (Herod et al., 2013a, p.378).

Indeed, the critique by Herod et al. (2013a) is mainly based on a theoretical argument about value and its meaning in Marxian theory[8]. This approach gives them the elements to move beyond the approach described above. Herod and colleagues propose, therefore, a different theoretical framework, based on three concepts inspired by Marxian theory: devalorisation, devaluation, and the global destruction networks (GDNs) (Herod et al., 2013; Herod et al., 2013a). While the first two notions follow Neil Smith's work on Marx (Smith, 1981; Smith, 2008), the latter is an original concept developed by the authors.

In the well-known passage on Machinery and Large-Scale Industry, Marx argues that machines do not create new value[9], but rather transfer their own value to products (Marx, [1867] 1976). This occurs through the labour of the worker, who works with them. However, a destruction of value may occur before the end of the lifespan of a machine. This may happen for two reasons. Firstly, a machine could be replaced by a new technology. As a result, the discarding of the old machine would destroy the

[7] It became clear during my fieldwork in Beijing that almost no glass bottles are processed by informal recycling systems because of the small profit in this activity.
[8] Value is here conceived as 'socially necessary labour-time', the labour time necessary to produce use-values (Marx et al., 1976).
[9] Here, the term value refers to absolute surplus-value. According to Marx, machines indeed create relative surplus-value as long as they do not come into general use in a certain industry, see p. 530-531 (Marx et al., 1976).

remaining value congealed in it. Secondly, the depreciation of labour could simply make it more profitable to produce without machines[10]. Here, again, machines would be discarded with the value objectified in them. Building on this passage, Smith (1981) describes devalorisation as the complete transfer of value from machines to products, and devaluation as the 'absolute destruction of value' (Herod et al., 2013a, p.379). Following this argument, Herod et al. (2013a) argue that when a commodity, such as a mobile phone, is discarded, though some value is still congealed in it, it is subjected to a process of devaluation. Should the commodity reenter the circuits of production, for instance when it is collected by an informal recycler, its remaining value would be saved and could even be increased by new labour objectified in it through the process of recycling.

The third concept on Global Destruction Networks is mainly an interpretation of the passage on the general formula of Capital (M-C-M'). Marx shows that in capitalist societies, two contradictory forms of circulation coexist: the commodity-money-commodity (C-M-C), and the money-commodity-money (M-C-M). Marx explains that while the first form is necessary for the exchange of commodities, the second serves to transform money into capital, and thus to create surplus-value (Marx, [1867] 1976). Here, Herod et al. (2013) argue that, just as value is transferred through the process of production, so it is transferred in the process of dismantling. The constituent elements of commodities are transformed into raw materials, which are in turn made into commodities, which could end up, eventually, again as waste products. They thus introduce a form of circulation that they call the waste-new product-waste (W-NP-W), which provides, according to the authors, a superior framework to challenge the notion of linearity in economic activity (Herod et al., 2013). Paraphrasing the work by Piero

[10] Marx gives examples of this latter phenomenon in the seventeenth and eighteenth centuries.

Sraffa (Sraffa, 1960), this form of circulation is a sort of production of waste by means of waste.

The authors show how the ongoingness of materials and value is linked to the human labour objectified into commodities. For instance, the gold used in a microprocessor today, could have undergone many transformations since its original mining by Incas or the Spanish, centuries ago (Herod et al., 2013). According to the authors, this shows how materials and value travel in time and space. Moreover, it highlights how GDNs are linked to GPNs and, therefore, how the geography of waste is linked to the geography of labour. Herod et al. (2013) suggest that this argument opens new important research questions for the political economy of capitalism, that until now have been neglected by academic research on waste. In particular, this unlocks possibilities to think about productive and unproductive labour. As the authors point out, if no surplus-value can be produced by a certain kind of recycling activity, then it is very likely that this activity will simply not take place. In this latter regard, the framework proposed by Herod and collegues (2013; 2013a), is useful to study ongoingness as well as its limits, and how these are determined under capitalism.

While I accept the argument above by Herod and colleagues, I believe that a number of nuances could be integrated into this analysis, which would refer to the different dimensions of the process of commodification. As introduced at the beginning of this section, Moore (2012) proposes to think about waste as a *parallax object*. In this sense, a waste product is the locus of antinomies (Žižek, 2006). For instance, waste can be understood as an 'object of nature', from the Marxian meaning of an object that is separated by its immediate environment, i.e. a plastic bottle scavenged by an individual collector, as well as it can also be comprehended as a raw material, an object that 'has

been filtered through previous labour' (Marx, [1867] 1976). This picture is complicated by another fact. As Marx pointed out, some products can be used both for consumption and for production. This is the case for grapes which on the one hand are used for direct consumption and on the other hand for the production of wine (Marx, [1867] 1976). The same goes for waste. The different functions which waste products inhabit in both the dismantling and consumption processes make evident their contradictions. A discarded mobile phone could be used as raw material for the extraction of precious metals, or as a ready product for the second-hand market. Its material conditions, i.e. the possibility to be an operative means of communication, as well as the degree of surplus value that can be extracted, will determinate the destiny of the electronic appliance[11]. However, material characteristics are not the only measure of waste. As described in the introduction of this thesis, the different meanings that people attached to commodities and waste trigger the penetration of alternative capitalist mechanisms (Hudson, 2008; Hudson, 2005).

Where then is the boundary between waste products and commodities, or in other words between waste and value? I believe that, simply, it exists in the exchange process. When waste is exchanged, it ceases to be such because it is subjected to a process of commodification, becomes value, and enters new circuits of consumption and production. However, this process often occurs in the shadow of informal markets. I argue, in this thesis, that the concept of invisibility can be suitably mobilised to analyse this phenomenon and bring to light different mechanisms of value creation and capture. This is the case, for instance, when an informal recycler realises the exchange-value of a discarded plastic bottle or an end-of-life mobile phone[12], and alienates its use-value, i.e. a

[11] The *functional* value of the commodity plays a central role here. However, as we shall see in following chapters, other factors such as legislation contribute to the fate of products. Commodification of waste, as suggested by O'Brien, Martin (1999) is not always a single situation.
[12] It is irrelevant, here, if the waste product has been scavenged from a waste bin or bought from a previous owner.

liquid container or a means of communication. It is through this process that waste metamorphoses into a commodity, and boundaries and edges become apparent. In Marx's own words, it is in the process of exchange that 'different products of labour are in fact equated with each other, and thus converted into commodities' (Marx, [1867] 1976). Waste products have now reappeared as commodities. Indeed, while circulating through what Herod et al. (2013) call Global Destruction Networks, or, as we will see in my thesis, through Local Informal Systems, waste products should be considered as commodities that circulate and exist in their dialectic nature of exchange and use-value (Dagognet, 1999). As Marx wrote, 'the capitalists know that all commodities, however tattered they may look, or however badly they may smell, are in faith and in truth money, […], and, what is more, a wonderful means for making still more money out of money' (Marx, 1976, p.256). As a result, investigating waste products is not that different from studying commodities, which, we know, are the elementary form of the wealth of societies in which the capitalist mode of production prevails (Marx, [1867] 1976). We are thus confronted by issues which belong to the study of capitalism and its variegated forms in time and space.

METHODOLOGY AND FIELDWORK

CHAPTER 2

'Sociological problems would certainly be simpler, if social phenomena had always a finished character. There is nothing more dangerous, however, than to throw out of reality, for the sake of logical completeness, elements which today violate your scheme and tomorrow may wholly overturn it.'

Leon Trotsky, *The Revolution Betrayed,* ([1937] 1991, p.216)

INTRODUCTION

My methodology draws upon ethnographic research methods, adopting a qualitative approach. It involves in-depth interviews as well as field observation. This is not novel in the field of economic geography (Clark, 2007; Clark, 1998; McDowell, 1992; Schoenberger, 1991; Schoenberger, 1992). Nevertheless, it is worth briefly justifying why I believe this approach is particularly appropriate to make sense of economic diversity in economies of recycling, which I examine in this thesis, and specifically useful to link my findings to the analysis of broader economic processes. Besides basic differences of qualitative and quantitative methodologies in economic geography (Clark, 1998; McDowell, 1992), the choice for an ethnographic approach is also motivated by the peculiar type of industry under examination. I believe that the shadow and underground nature of informal economies in general, and of the waste industry in particular, makes the adoption of qualitative methods the most appropriate approach, and I justify this in the following paragraph.

Firstly, as often suggested in the literature (Lepawsky et al., 2015; Wang et al., 2008), there is little official and reliable data on waste and informal economies of recycling. The adoption of quantitative methods to investigate this industry would make it therefore very difficult to test observations against standards of significance, relevance, and coherence and would probably transform stylised facts into an aesthetic exercise with little empirical value (Clark, 1998). Secondly, elements such as crime and corruption, as well as a range of other practices at the boundary between formality and informality, and legality and illegality, are constitutive elements of the economies analysed in this thesis. They need, therefore, to be reintroduced to describe and analyse the deep texture of local circumstances that characterise the industry (Clark, 1998). Adopting a method that would ignore these factors, and their variety in time and space, will simply fail to give a decent account of what this industry is. Qualitative methods, based on interviews and participant observation, are thus the most appropriate tool to study this industry. This does not mean, however, that some of the findings of this work cannot be complemented in future research through different methods (Clark, 2007). One of the aims of my thesis is to give a sense of the variety of economic activities connected with waste in order to influence public policies that at best neglect, at worst deny, the potential positive function of informal and traditional actors of the waste industry. This is after all a constructive enterprise.

Therefore, in this thesis I adopt an ethnographic approach that owes much of its methodology to anthropology and critical geography (Hoggart et al., 2002; Lora-Wainwright, 2013; Lora-Wainwright, 2007; Tickell et al., 2007), as well as feminist economic geography (Massey, 1991; McDowell, 1992; McDowell, 1998). During sixteen months of in-depth field research among actors of the waste industry in China, I engaged into structured, semi-structured and informal conversations with a large number of

different actors, from migrant workers to political and economic elites (McDowell, 1998) and experienced a great variety of the different choreographies of close dialogue (Clark, 1998). In this regard, my positionality was influenced by my different identities as an Oxford student, a foreigner, a Peking University visiting graduate, an insider/expert in the industry, a young white Italian man, and so forth. All these aspects played different and important roles in shaping my relationships with informal recyclers, Chinese national officials, local academics, European entrepreneurs operating in China or other interlocutors. They opened or denied access to information in ways that were not always easy to assess. Nevertheless, during the entire period of my fieldwork, I tried to be as fair and honest as possible about who I was and what I was doing. Still, I often found myself switching from the role of expert to the role of ignoramus (McDowell, 1998). I was constantly challenged to describe the content of my research according to the knowledge and education of my interviewees, as well as according to the progress of my own work at a specific moment in time.

Working both independently and in collaboration with local academics, as described in the following section, I had the opportunity of experiencing a wide array of situations in the field, ranging from one-to-one to group interviews, and from engaging with elites to dialoguing with migrant workers. This experience has been an extremely formative process that sharpened my research tools and improved my academic skills. It goes without saying that this was not achieved without encountering major problems and complications. However, I believe that these difficulties helped my learning process by forcing me to rethink not only the methods of my research but also the objectives of my study. Therefore, in a metaphorical sense, rather than describing my overall experience as that of executing a preconceived plan, it is quite fair to depict it as a more humble process of learning by doing. However, I do believe that the 'increasing returns'

embodied in my 'human capital' towards the end of the fieldwork were comparatively high.

FIELDWORK

Pre-fieldwork Activities

Prior to fieldwork research, I conducted a literature review and also analysed EU directives and national legislations on waste. Once on site, I collected relevant primary sources such as laws, regulations, and reports as well as other documents such as magazines articles, documentaries, reports, and academic work in Chinese. I then developed a number of different questionnaires for semi-structured interviews (included in the DVD) and focused on the choice of representatives, from different groups, to be interviewed in order to inform my research.

A sample questionnaire for semi-structured interviews is included in the appendix. The sample refers to one of the first questionnaires designed towards the beginning of my fieldwork, framed in particular for interviews with members of NGOs. It is divided into four broad areas, themselves subdivided into various subthemes. Each subtheme assembles questions that are slightly different according to interviewees and organisations. This structure helped generate the relevant questions for different informants while allowing consistency for data comparison. The broad themes in the sample questionnaires are *Basic information*, *Organisation*, *E-waste management system*, and *Impact and result*. When I first developed this structure, a major concern was the investigation of the implementation of a formal system for the management and

recycling of waste electrical and electronic equipment in China. I wanted to gather different narratives of actors involved (or not) in the formalisation of the industry, in order to investigate the politics of this process. Therefore, in the sample a relatively large number of questions addressed this issue, which still plays a central role in the thesis, being discussed in three of the five empirical chapters. However, a number of unexpected themes arose while conducting my field research. These include the relationship between informal recycling and the urbanisation process, livelihood strategies and labour agency in the informal economy, the politics of incineration and waste sorting and other themes. Therefore, more questions were integrated in the interview structure later, while other themes were estimated less relevant and were not always approached. This can be appreciated in the two examples of transcripts included in the appendix. While the first interview, with the manager of a well-known Chinese state-owned company producing EEE and implementing its own WEEE recycling program, follows quite strictly the questionnaire structure, this is not the case for the second transcript. The latter, an interview conducted with a local environmental activist in Beijing, while following the overall structure of the questionnaire, is more concerned with the themes of incineration and waste sorting.

In general, while interviews with formal actors or institutional representatives followed more closely the structure of the questionnaire attached in the appendix, this was not the case for interviews and conversations with actors in the informal economy. First, not all informants in the informal economy were as familiar with legislation on WEEE and policy concepts such as *Extended Producer Responsibility* as their formal counterparts working in the electronics industry. Second, new interesting themes arose in the early phases of field observation in waste markets, such as, for instance, the importance of sociocultural factors in the economic organisation of informal recycling in China.

Therefore, a questionnaire, available in the DVD attached to the thesis, focusing on the social and economic organisation of informal recycling was designed in order to investigate these new topics. Third, it was not always possible to record interviews and to follow the structure of the questionnaire. Most of the encounters, even with key and recurrent informants, were conducted in a more casual manner while carrying out field observations in waste markets. Sometimes interviews were carried out during workers' rest-break or while sharing a meal with them. More flexible research tools, such as participant observation and proper ethnographic methods worked better in this setting. Therefore, a recurrent technique used to collect data, as explained in more detail later in the chapter, was to jot down notes on a journal and subsequently write reports of the visits in the market.

Semi-structured Interviews and Recruitment of Informants

Semi-structured interviews were one of the main methods adopted to collect data. This format gave me the possibility to investigate unexpected themes that arose during interviews with more flexibility while maintaining consistency for better data comparison. Questions were frequently revised, particularly at the beginning of the fieldwork, when emerging themes from previous interviews or informal conversations arose. In total, 37 semi-structured interviews were recorded after explicit consent of informants. The appendix includes the complete list of recorded interviews. This is a very rich set of primary data, which include interviews with:

- representatives of informal enterprises
- local officials
- one high ranked national official
- managers of certified Chinese WEEE recycling companies
- one Chinese producer of robotic recycling systems

- one manager of a foreign company managing landfills in China
- Chinese and foreign managers of companies producing electronics equipment
- Chinese, European, and foreign academics
- environmental activists
- two representatives of a foreign company providing waste management solutions in China
- one representative of a EPR scheme operating in Europe.

In addition, I had access to the transcript of an interview carried out by my supervisor Dr Anna Lora-Wainwright with the manager of a formal industrial park for e-waste recycling in China.

In China, I was affiliated with the College of Urban and Environmental Sciences at Peking University, where I worked under the supervision of Dr Tong Xin, a leading international scholar in the field of e-waste. In Beijing, I collaborated closely with one of Dr Tong's graduate students, Ms Tao Dongyan. Her collaboration and help was very important in assisting the smooth and scheduled running of my fieldwork. Both academic and administrative support from Dr Tong Xin and Tao Dongyan has been constant throughout my entire period of study in China. My research would have been very different without their help in carrying out fieldwork research, solving bureaucratic practicalities, such as visa procedures, and entering quickly into the field. From the very first days, they introduced me to a large number of informants and accompanied me to informal sites of waste recycling. Together, we also co-authored a research article (Tao et al., 2014) published in the Chinese peer-reviewed journal *Urban Planning International* and we participated in a number of international conferences, presenting research papers and one poster (e.g. AAG 2014, AAG 2016). I describe in more detail the relationship with local academics and my positionality in the field in the following section, focusing here on the different methods adopted to recruit informants.

In Peking University I actively participated in local academic life. I regularly contributed to team meetings within Dr Tong's group, presented my research on one occasion, and gave a lecture on Local Production Systems within the bachelor's reading course of Industrial Geography. I audited several reading courses in Chinese, such as Economic Geography, Cultural Geography, Special Topics on Chinese Economy, and other courses taught by local scholars. On several occasions, I met and discussed my research project with Prof He Canfei, a well-known international scholar in the field of economic geography, benefiting greatly from these conversations. Besides being a source of intellectual growth, my engagement in the academic life of Peking University was essential in building trust with Dr Tong Xin and her students. This allowed me access to a number of high profile informants, such as the Chief of the Business Development Department of the Chinese Ministry of Industry and Information Technology (MIIT), the Chair of the China Household Electric Appliance Research Institute as well as other high ranked officials and academics.

During my fieldwork, I took part in activities with several foreign organisations. This helped me to reach a number of foreign informants such as managers of multinational companies providing waste management services in China. I also took part in several academic and professional conferences. This gave me the possibility to recruit a number of informants from the industry, reinforce trust with key informants previously recruited, and collect other relevant data such as the annual white paper on the industry. Moreover, I joined fieldtrips to certified facilities in recycling parks as well as electronic products companies in Beijing, Chengdu, Tianjin, Shenzhen, Shanghai and Guiyu. In Shanghai and Guiyu, a major Chinese informal recycling hub in Guangdong province, I also carried out field research in informal enterprises together with Tao Dongyan.

From November 2013 to December 2014, I witnessed the development of a community-oriented pilot project, the *Hongfuyuan Environmental Protection*, for waste sorting and mobile phone recycling in Beijing. The project involved both formal and informal actors and had Peking University as one of the main stakeholders. I followed the project from its planning stages to its implementation. I participated in project meetings and carried out semi-structured interviews and participant observation with local residents, project representatives as well as other actors (e.g. local youth NGO). I also took part in a number of meetings and campaigns of environmental NGOs in Beijing. I became a member of the Waste Institute (垃圾学院), an IT platform based on a popular Chinese mobile phone application. The Waste Institute serves as an informal network to share information and organise activities between the major environmental NGOs and activists focusing on waste in Beijing. This provided a number of relevant insights. I developed a good relationship with the initiator of the platform, a well-known young Chinese activist and scholar, who led the Asuwei (阿苏卫) anti-incineration campaign in Beijing.

Finally, towards the end of the fieldwork, I came into contact with a European company providing waste management solutions, which was trying at the time to enter the Chinese market. The company asked me to provide information on informal recycling, which I did on an occasional basis. I did not receive any economic remuneration for this activity, but I asked to participate in meetings the company had with actors from the informal economy and I realised a number of semi-structured interviews with two managers (one European and one Chinese) of the company in Beijing. In this way, I developed a classic *seller/buyer* relationship with this informant (Clark, 1998). This provided a number of insights concerning the company's strategy, its lobbying techniques with official Chinese bodies, the politics surrounding the establishment of a formal scheme for the management of e-waste (electronic waste, WEEE, or waste electrical and electronic

equipment), and information on formal-informal linkages in the waste industry in Beijing.

Relationship with Local Academics and Positionality in the Field

During my fieldwork in China I had the opportunity to carry out research both in collaboration with local academics and alone. I discovered a number of important advantages and disadvantages in both cases. One major point concerns the well-known issue about the status of the researcher as an 'outsider' or 'insider' in a foreign country (Herod, 1999). Positivist understanding of knowledge production is usually keen in conceiving the position of local researchers as the privileged one. The wider knowledge of the general context where the 'insider' is carrying out research is understood as beneficial to gaining access to 'truer' knowledge. However, this conception of pre-existing knowledge fails to recognise how the phenomenon of knowledge creation involves both the interviewer and the interviewee. It is therefore a process often differently shaped by 'insiders' and 'outsiders', which results in the production of different rather than more or less objective knowledge (Herod, 1999). Moreover, the position of the researcher is better understood as an evolving state of 'betweenness', rather than a sharp dualism of insider/outsider (Herod, 1999). In this regard, I cannot consider myself as a complete 'outsider', having studied Chinese for more than 10 years and speaking the language fluently. Moreover, I have lived, studied, and worked in Mainland China and Taiwan for a total period of more than 3 years. In these years, I managed to build a large network of contacts from local elites to different kinds of professional groups. This eventually defines me more as a semi-outsider or semi-insider of the Chinese society, rather than an absolute outsider. In addition, the growing

knowledge of the industry that I acquired during my research in China transformed my position from being seen as something of an outsider to being seen as more of an insider. As a result, I could position myself in different ways during field research (Herod, 1999), which definitely made me someone working 'in-between'. For instance, towards the end of my fieldwork, as also described in the previous section, I came into contact with a foreign company working in the field of waste management and recycling. The company's managers considered me much more of an insider of the industry than their local Chinese staff. I could then play this to my advantage in accessing new information as explained above.

Moreover, having closely conducted research with local researchers I have had the opportunity to witness the advantages and difficulties that 'insiders' encounter in the research process as well as being able to 'see the world through their eyes'. First, I would suggest that while a number of cultural biases affect the attitude of foreign researchers, the same is true for local scholars. Paradoxically, the low exposure to local narratives on informal recycling, often stigmatised in press and official discourse in China, eventually put foreign researchers in a relatively more neutral position in approaching this topic. Second, I recognise that my positionality closed access to a number of informants. At first, it was not unusual to be mistaken for a journalist, and this was certainly a disadvantage to recruiting a number informants. However, in contrast to what I was expecting, I found that being a white westerner was, most of the time, an asset. In general, informants in the informal economy were positively surprised and slightly amused in learning about my research, 'a westerner coming to China to watch trash'[13], as one of my key informants succinctly put it. As a result, I easily gained access to a number of key informants and quickly built trust with some of them. Third, being a foreigner in

[13] "老外来中国看垃圾"

China also helped me to create empathy with a number of people. During fieldwork, I was often asked about my own country. Talking about cultural differences and similarities was usually accompanied by good laughs that made conversations and interviews more relaxed and definitively helped me gain trust with informants. Fourth, not being seen as associated with local institutions was an asset, making disclosure of sensible information less problematic for a number of informants. Finally, I also believe that when I carried out research independently as an 'outsider', informants generally paid more attention to answering my questions, being aware of my language barriers. They often repeated important information more than once, reformulating sentences in a different way. This not only helped me in communicating with them, but I believe that it also worked as an unexpected mechanism of self-verification for my interviewees. I think that repeating information by reframing sentences forced them to be more accurate in deciding which content was the most relevant and in clarifying the meaning of unusual terms or processes of the industry unknown to scholars, regardless of their being foreigners or locals.

I also understand that gender and race were factors that opened and closed a number of opportunities. While interviews with officials, academicians, activists and representatives of the formal economy were realised equally across gender lines, this was not possible with informal actors. First, women were under-represented in the field sites. Second, my position as young white unmarried man was an obstacle to building close relationships with young women living in a community sharing traditional values. As a result, interviews and conversations with women working in the informal economy were mainly carried out with older members or the wives and mothers of key informants. However, being a man could also, at different times, be an asset. I was often invited to eat food or drink alcohol by male migrants, which I eventually did in a number of cases when

carrying out research independently. I believe that these activities strengthened the connection with my informants. I was able to build trust and develop very good relationships with several key informants. It was in these occasions that a number of personal accounts were delivered to me. This helped me better understand the hardships my informants encountered and create a strong empathy with them. I believe that through this process I developed with a small number of my informants what could be called friendships.

'Waste Markets' and the Local Informal System

From September 2013 to December 2014, I carried out field observations in major waste markets in Beijing and in related businesses across the city (e.g. 'waste stations', second hand shops, etc.), constituting what I define in my empirical chapters as a Local Informal System. In particular, I carried out research in two major and well-known waste markets in Beijing, Dongxiaokou (东小口) and Xiejia (歇甲), which were demolished in early 2015. In these two waste markets, I manually recorded the number of enterprises in order to have a rough estimate of their distribution. This data has been further processed to create maps of the two locations.

In Dongxiaokou and Xieya, I carried out semi-structured interviews and hundreds of informal conversations with entrepreneurs, workers, local residents, local officials, owners of complementary businesses (e.g. supermarkets, restaurants, mechanics, logistics), a manager from a local state owned company, and other local actors. A good part of interviews and conversations with informal actors focused on biographical

accounts, practices of informal recycling, and the broader socioeconomic context of the industry.

Figure 1. Map of Dongxiaokou, late 2014.



It is worth mentioning that in recent years a number of criticisms have been addressed to this kind of ethnographic studies in economic geography. In particular, it has been argued that qualitative research focusing on economic practices at the micro scale is not well situated to produce theoretical generalisations or relevant public policy works, lacking theoretical and methodological rigour (Jones and Murphy, 2010). Yet, while a number of problems exist, qualitative methods are increasingly used in the discipline (Crang, 2002), and their limits can be easily overcome. When qualitative research is engrained into a solid theoretical framework and triangulation techniques are carried out, this approach represents a powerful tool of analysis and a rigorous epistemological and methodological strategy to represent and analyse the complexity of economic processes (Jones and Murphy, 2010). It can be used for the investigation of how higher structures such as institutions, classes, networks, gender and race inequalities are produced, reproduced, and eventually transformed in time and space by individual and collective

actions at different scales (Jones and Murphy, 2010). Therefore it can serve to understand larger socioeconomic processes and the formulation of theoretical generalisation.

As I have described in the previous section, in the context of waste markets informal conversations and participant observation worked as better research tools than semi-structured interviews to collect data on practices of economic actors. As we carried out our field observations, both Tao Dongyan and I wrote and exchanged reports during the entire period of my research in China. These are a rich source of primary data. In the following table, there are three fragments of reports (from a minor waste market, a residential neighbourhood, and a formal recycling company) written in autumn 2013, which I integrate here as an example. There is a more comprehensive list of reports and other main research activities in the appendix. Further, 29 samples of these reports in Chinese and English are included in the DVD attached to the thesis. Some of these reports were the result of field observations carried out together with Tao Dongyan, while others were written after our independent research in the field. This allowed triangulation of data and ensured that gender and race biases were taken into account.

Because it was usually impossible to record informal conversations, we used different techniques to collect data. At the beginning of my fieldwork both Tao Dongyan and I used to write reports or hand-written notes after our research in the field relying on memory and visual data such as pictures and videos. However, in the last months of my fieldwork I used to quickly jot down sentences and keywords on a small notebook, while addressing informants. Subsequently, both Tao Dongyan and I went through these notes and wrote the content of the reports. This technique was particularly effective when carrying out observations together.

Figure 2. Reports, Carlo Inverardi-Ferri and Tao Dongyan

Fragment 1. Houbajia, Nov 19th 2013, Informal recyclers. (Carlo Inverardi-Ferri)

The other site is next door. The atmosphere is slightly different. Here, more people are interested in us. There is a dog sitting on the top of a mountain made of compressed metal. It stares at us. We take some pictures. We have already talked with some people but we haven't yet found any e-waste. I turn and I walk in the direction of a small workshop. Dongdong [Tao Dongyan] steps forward in the direction of the dog, twenty meters away. As she moves, the dog jumps down and starts running towards us. […]



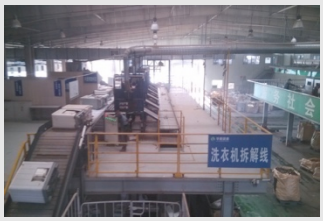
Fragment 2. 华清嘉源, Nov 18th 2013, Semi-formal recyclers (Carlo Inverardi-Ferri)



Third and last interview of the day. When we arrive, the laoban [master] is cleaning the street of leaves. His employee is filling a little truck with papers for packaging. He is from Anhui. He is very friendly. He is the only (semi)-informal recycler we found so far who has an employee. He pays 20000 Yuan per year to the xiaoqu for the right to live in a small room with his family, and the privilege of being the only official waste collector in the community. He pays 2000 Yuan per year to the company 海淀回收公司 (HH). He is protected both in the regard to the state and of the xiaoqu. He has a kind of affiliation, (certification) with HH. The company is in contact with the neighbourhood and that's why the guy was sent here. He has done this work for more than 10 years. He is very open and friendly. He earns something between 7000 and 10000 Yuan per month. He lives here, in a 13 square metre room with his family. […]

Fragment 3. Huaxin. November 21st, Formal recycling company (Tao Dongyan)

根据排班表看，共有三条电视机处理线、两条洗衣机处理线，一条冰箱处理线和一条空调处理线，实际运转的只有洗衣机和电视机的拆解线各一条，和冰箱线的夜班（冰箱拆解工艺更复杂，人力少，耗电大，故只开夜班，利用分时电价节约成本）。现状处理规模远小于满负荷运转上限，对未来可能的新增回收量有较大的容纳力。[…]



By contrast, while carrying out research independently, this method slowed down the process of data collection. Alone, I needed to be more accurate in writing down my notes and ask my interviewees to repeat information, not been able to rely on the help of a local colleague for the writing of the reports. However, these difficulties eventually resulted in a deeper involvement of my informants. It was not unusual that some of my interviewees wrote on my notebook key passages of the conversation when they wanted to help me. For instance, one of my informants, the child of a big informal boss trading second-hand electronics and a student in economics at the time, sketched down the value chain of the family business on my journal. Indeed, this greatly simplified not only my data collection, but my analysis as well.

Figure 3. Photographs



Finally, I took hundreds of photographs and videos in the waste markets. This visual documentation has been particularly valuable in the data analysis and writing process, providing a useful counterpart to interviews and reports. During the entire period of my fieldwork, I adhered to the ethical guidelines of the University of Oxford and of the Royal Geographical Society. I always introduced myself and my research. I asked for explicit consent before making individual interviews and I audio-recorded them only with the permission of my informants.

Data Analysis

I came back from fieldwork with a very rich variety of data. In Oxford, from mid-January to mid-March 2015, I read the reports realised in the field and classified them according to subjects. I created a database where I copied relevant passages of reports and interviews and associated each quote with a broader theme, such as *family*, *competition*, *scale*, *intra-district trade*, *corruption*, and so forth. Subsequently, I transcribed three of the interviews recorded in Chinese and asked the help of two Chinese friends to transcribe

eight other interviews. With some interviews being up to two hours long, the transcription was a time consuming process. Consequently, I decided to listen to the remaining recordings and transcribe only relevant fragments, which covered information not contained in the reports. I then implemented data triangulation. Following Yeung (2003) triangulation in my research involved both data collection and analysis. As explained in previous sections, research carried out by my fellow student Tao Dongyan better represents the position of an 'insider'. Instead, when I was carrying out research alone, I was often put in the position of a '(semi)outsider'. Some scholars have criticised this kind of triangulation of sources arguing that rarely two 'investigators observe the same phenomenon' (Yeung, 2003, p.455). However, together with Yeung (2003) I believe that this process of comparing observations made from different perspectives is not a weakness of my research, but rather one of its major strengths. It is what enables me to approach the study of Chinese capitalism, an hybrid phenomenon, from a more critical standpoint, avoiding 'over-socialised' analyses (Yeung, 2007). With this in mind, I selected relevant fragments from interviews and reports realised in different moments in time and designed the structures for the individual chapters of my thesis. This technique of 'montage' (Eisenstein, 1943), which has an increasingly 'strong presence in social science writing for its ability to enable pieces of fieldwork in separate space-times to be "clipped together" (Beach, 2001)' (Barua, 2013, p.62), was particularly powerful in articulating my argument. Finally, documentaries, media and official reports as well as other documents collected in the field offered a counterpart (Lora-Wainwright, 2016) to the data described above, and were very valuable in gaining a broader picture of the complex relations between formal and informal dimensions of waste recycling in China.

To protect the anonymity of my informants, I have always adopted pseudonyms in the text, except for activists of the Environmental NGO *Nature University*. Members of this

organisation have over the years themselves promoted their activities, which are described and analysed in the text, in a variety of public media, such as magazines and digital publications, and their anonymity is therefore not possible given the public role played by these individuals. Similarly, as it strengthens analysis, I use real place names since I believe that this does not contribute to the identification of my informants.

A BRIEF HISTORY OF WASTE AND RECYCLING IN CHINA

CHAPTER 3

'People walking by would often see him sitting happily in the middle of these high-quality scraps, looking as if he were sitting amid a pile of jewels.'

Yu Hua, *Brothers*, (2009, p.390)

INTRODUCTION

In his novel *Brothers*, the Chinese writer Yu Hua describes the history of his country from the harsh years of the Cultural Revolution to the emergence of capitalism in Contemporary China, narrating the story of two brothers: a state worker and a scrap collector. Recycling, indeed, is an activity deeply rooted in Chinese society, and plays, unsurprisingly, an important role in literature and popular culture. As pointed out by Goldstein (2006) waste is a potent foil to understand the social and economic changes in the history of China, and understand, in turn, the 'imaginary of citizenship, society, or nationhood through the changing daily-life habits and rhythms of recycling in urban China over the last century' (Goldstein, 2006, p.261). Therefore, this brief historical part, mainly based on secondary sources and a few first-hand materials such as archival documents and personal communications, focuses on the history of waste and recycling in China to provide a number of insights that will be useful knowledge for the following empirical chapters. Here, I adopt the categorisation usually employed in literature on China that divides the history of the country into the three periods of Republican,

Socialist, and Post-Maoist rule. While sketching this brief account, I focus in particular on Beijing, not only because historical research has concentrated on it, but also because a great part of my empirical materials, presented in following chapters, has been collected in this city.

REPUBLICAN CHINA

The Republican Era (1911-1937) has a special place in constructing the imaginaries of the past in contemporary China, and in particular in Beijing. What is often labelled as the 'old Beijing', as portrayed in photographic and literary representations, often refers to the Republican years (Dong, 1999; 2003). Snacks, advertised as the 'old Beijing' taste, are not inspired by dishes from imperial China, but are rather derived from food sold in the streets of the capital in the twenties (Dong, 2003). An entire atlas of material life has been inherited from those years, which mingle with different temporalities in today's China, highlighting the dialectical relationship of past and present. History is mobilised as an integral element of the present, and an understanding of the past is reworked in this process, while material remains become resources to cope with everyday life (Dong, 2003). This process of reworking the past also characterised, symbolically and materially, the Republican period. Interestingly enough, conceptions of waste and recycling appear to be a useful tool to draw similitudes and highlight differences between those years and today's China.

In Republican years, cities were transformed in their spatial structure by official power, as well as physically changed by its inhabitants. The city was not only the place were national politics unfolded, but also the space used by common people to improve their

material life through a variety of practices and strategies (Dong, 2003). A typical figure of this geography was the street collector or ragpicker, one of the main agents of the process of anchoring the past into the present, through the action of 'recycling' (Dong, 2003). Recycling, however, had a very contingent social meaning in the Republican era (Goldstein, 2006). In those years, very little was wasted, but salvaged commodities were carefully sorted and promptly reused. Therefore, what is often associated with imaginaries of waste and recycling in contemporary societies strongly differs with the wide range of everyday practices and employments that characterised waste in Republican China (Goldstein, 2006). Today, imageries and practices of recycling often correspond to the recovery of raw materials through technologies of shredding, melting, and mashing (Goldstein, 2006). However, in Republican China few commodities passed through these kind of processes. Recycling was intimately connected with reusing. Refuses were very rarely discarded, but passed through the hands of workers, merchants, consumers, and tourists to be reinvented in their meanings and material lives (Goldstein, 2006).

During those years, new historical contingencies and economic forces had brought about the emergence of a great number of practices as well as places of recycling (Dong, 2006). Many people in the city made a living through craft activities connected with the trade of second-hand goods. This contributed to the construction, both symbolically and materially, of new spaces (Dong, 1999). Several 'dark markets' appeared in Beijing. Here, it was possible to meet merchants, artists, and entertainers (Dong, 1999). Some of these markets appeared in the small hours of the night only to disappear in the early morning. Others were tolerated and contributed towards being an integral part of Beijing. The biggest of these places was Tianqiao (Dong, 1999; 2003). Tianqiao was situated in the southern part of the city, under the shadow of the Temple of Heaven. It was described in

the literary accounts by Chinese authors of the time, such as Lao She or Zhong Ruoxia (Dong, 2003). Tianqiao was an exciting yet chaotic and confusing place, and it produced mixed reactions in its visitors. Here, old, stolen, and counterfeit commodities were daily traded by merchants that carried out their businesses side-by-side with artists who entertained people with wrestling performances and pornographic amusements (Dong, 2003). Not surprisingly, Tianqiao gained a reputation for disorder and dishonesty (Dong, 2003). Nevertheless, it was a place that made life enjoyable for the inhabitants of the capital, offering an experience of modernity (Dong, 1999). This was neither constructed in opposition to traditional culture, nor was it a straightforward import from the West (Dong, 2003). It was an endogenous process embedded in a historical and geographical context, which interpreted both a condition of existence and a collective consciousness of the developing changes in the Chinese society (Dong, 2003). Indeed, dimensions of waste and recycling in the Republican era were a complex social phenomenon. While they shared few elements of the contemporary patterns of consumption and disposability, they involved instead quite a great deal of communal identity and personal feeling (Goldstein, 2006). Romanticising recycling would mask, however, the power relations, the exploitation practices, and the violence that also characterised the industry in those years (Goldstein, 2006). Some elements of this complex reality were lost in the Maoist period, others reappeared, interestingly enough, in the China of the Reform period. I analyse these changes in the following parts.

MAOIST RULE

Soon after 1949, the network of recycling artisans that operated in China in the Republican era experienced a period of relative expansion, but during the 1950s the

industry was deeply reformed by the new communist rule (Ensmenger et al., 2005). With the advent of the Communist Party and the reorganisation of the social, economic, and spatial life in Maoist China (1949-1978), imaginaries of waste and conceptions of waste management were also subjected to major changes. In the Republican era, discards were also elements through which the past was anchored to the present thanks to a number of craft activities and second-hand trades (Dong, 2003). Values of waste were thus intimately connected with the uses and meanings that people gave to commodities. In contrast, in the socialist era, a major shift occurred that modified the definition of waste as well as the relationship of people to the physical world. While recycling became increasingly connected with the abstract category of resource, a system of industrial recycling appeared in China, modifying everyday practices of disposability (Goldstein, 2006). At the same time, this change had major consequences in shaping both the working conditions of people involved in recycling, and the spatial organisation of the network of these activities, reflecting the political economic project of the *danwei* [14] (Tang and Feng, 2000; Tang and Feng, 2002).

In Beijing, a new system for waste sorting was gradually implemented during the 1950s. Yet, as recognised by documents from the Sewer engineering bureau[15], a local bureau in charge of implementing the reform in a number of neighbourhoods of Beijing, this project involved the transformation of daily practices and even if authorities were 'unanimously in favour and supportive of the reform, however, it involve[d] many aspects, which made the issue complicated' (Beijing Archives, 2011, p.106). Gradually, recyclers were transformed into state workers and markets such as Tianqiao, which had gathered armies of hawkers, artisans, and entertainers, disappeared from the map (Goldstein, 2006). This transformation not only affected conceptions of waste but also

[14] Working unit.
[15] 北京市上下水道工程局.

everyday practices. However, in a society where commodities were rare, the passage to socialism did not end the 'stewardship of objects' (Goldstein, 2006, p.271), as it happened in countries, such as the United States, where new practices of consumerism and disposability had arisen in those years (Dong, 2003; Goldstein, 2006). Yet the meaning of waste and recycling in the public sphere radically changed. Recycling became an industrial process. As pointed out by Ensmenger et al. (2005), this was not driven by the ideology of environmentalism that characterises recycling in the contemporary era, but was associated with the philosophy of building a new nation. While small financial incentives encouraged people to bring recyclables to collection stalls, these small acts of material conservation became a practice of individual and communal responsibility (Ensmenger et al., 2005). This affected not only the relationship of people with commodities and discards, but also the meaning of citizenship in Maoist China (Goldstein, 2006).

During the collectivization movement at the end of the 1950s, more than 7000 recyclers were integrated as state workers in the Beijing Municipal Scrap Recycling Company (Ensmenger et al., 2005). Furthermore, in 1966, the state-owned enterprise modified the name to Beijing Municipal Resource Recycling Company, which better reflected the change that had already occurred in recycling practices as well as the metamorphosis of the collective imaginary of waste, now conceived as a material resource (Goldstein, 2006). The Beijing Municipal Resource Recycling Company was at the head of a system organised into three levels that comprised local collection points, sorting stations and treatment facilities (Tao et al., 2014; Tong and Tao, 2016). This system was subjected to the pressure of new political and economic forces during the years of the reforms, which I introduce in the following part.

REFORM ERA

In an ironic twist of history, ragpickers and hawkers, who had characterised the Republican era, reappeared in Chinese cities in the Reform era (after 1978), to personify, once again, the paradoxes of development. Their return to contemporary China is engrained in a number of major shifts that affected the country, such as the marketization and monetization of the economy, the changes in land policies, the process of internal migration, and the emergence of narratives on environmental protection and sustainable development (Goldstein, 2006). While these themes are further examined in the empirical chapters of the thesis, it is worth briefly exposing in broad terms some of these changes in the following paragraphs.

In the last three decades, Chinese cities have experienced huge waves of urbanisation. This process, besides changing the physical landscape of metropolises, has also had major consequences in reworking imaginaries around waste and recycling practices in the country (Ensmenger et al., 2005). The urbanisation process had a symbiotic relationship with the emergence of informal recycling in China. Indeed, the very collapse of the system constructed under the planned economy was driven by the physical transformation of urban centres. In a society that had increasingly adopted new behaviours of consumption and disposability (Minter, 2013), the recycling network inherited from the socialist era itself became a disposable vestige (Ensmenger et al., 2005). In the remaking of the urban space, official planning simply erased from new master plans the collection and treatment points for recyclables, which gradually disappeared from the maps of Chinese cities as urban redevelopment projects increased (Ensmenger et al. 2005).

While consecutive waves of migrant workers from rural regions entered costal metropolises, attracted by the possibility to improve their material lives, their presence in the city became associated with the most humble employments and activities (Minter, 2013). Following the new consumption patterns of the Chinese society, new types of recyclables multiplied and when the state recycling system inherited from the Maoist years collapsed, a lively and hungry informal economy took its place (Tang and Feng, 2000). Migrants ran these activities over the ruins of the old recycling system of the socialist era, which in Beijing went bankrupt in the 1990s (Ensmenger et al., 2005). It is in this historical context that places such as the Henan village (Béja et al., 1999), appeared in Beijing and other major Chinese cities. All over the country a growing number of places specialised in the treatment of recyclables, both produced internally and imported from abroad, appeared in second-tier cities (Minter, 2013). For instance, the small county of Wen'an in the province of Hebei, hosting more than 20,000 family-owned workshops, became a major hub for the secondary processing of scrap plastics (Minter, 2013).

The growth of informal recycling activities was, however, accompanied by the emergence of contrasting narratives on their social function. Migrants were usually subjected to a social stigma. As for the case of Tianqiao in Republican era, places of recycling in contemporary China, the 'waste villages', were increasingly considered out of control and associated with illegality and disorder (Tao et al., 2014). As a result, local authorities first banned recycling markets in Beijing at the end of the 1990s, and when these measures did not succeed in eradicating the industry, they tried to revive a public system for the treatment of recyclables (Goldstein, 2006). However, the socially embedded nature of informal recycling gave an important competitive advantage to this resilient industry that still characterises the daily life of many people in contemporary China, as I show in the following chapters.

VARIEGATED RECYCLING

POWER, PLACE, AND MATERIALITY OF WASTE

CHAPTER 4

'Capital knows no county.'

George Harvey, *Capitalism in the Northern Coalfield,* (1917), *cited in* Ray Hudson (2016)

INTRODUCTION

In this chapter I conceive waste as a commodity that circulates and exists in its dialectic nature of exchange and use-value (Dagognet, 1999; Herod et al., 2013; Herod et al., 2013a; Marx, [1867] 1976) and I engage with recent debates on linearity and 'ongoingness' in economic activity. Literature focusing on this issue has been particularly productive in providing accounts of the afterlives of waste (Bloch, 2013; Brooks, 2013; Crang et al., 2013; Gidwani and Reddy, 2011; Gregson and Crang, 2010; Gregson et al., 2010; Lepawsky, 2015a; Lepawsky, 2012; Lepawsky and Billah, 2011; Lepawsky and Mather, 2011; Lepawsky and McNabb, 2010). While the performativity approach (Callon, 2006), based on actor network theory (Latour, 2005; Law and Hassard, 1999), took up the majority of the debate (Herod et al., 2013a) and became, in recent years, the dominant paradigm in the field (Gille, 2010; Gille, 2007; Lepawsky and Mather, 2011), other studies rooted in Marxist (Herod et al., 2013; Herod et al., 2013a; Wong, 2015) and

cultural political economy (Hudson, 2008; Hudson, 2005; Pickren, 2015) perspectives have also appeared in the literature.

From their respective standpoints, these emerging bodies of scholarship have often mobilised global value chain (GVC), global commodity chains (GCC), and global production networks (GPN) frameworks (Dicken et al., 2001; Gereffi et al., 2001; Henderson et al., 2002) to examine the circulation of end-of-life commodities and to challenge unidirectional and linear notions of economic activity. A common argument is that obsolete and discarded products travelling both within and across countries become the starting point of new rounds of commodity production and value creation (Crang et al., 2013; Herod et al., 2013; Lepawsky and Mather, 2011; Wong, 2015). In particular, this scholarship has provided a number of contributions to debates in economic geography that I briefly summarise below. First, it has outlined that the circulation of waste is characterised by different dynamics of supply and demand compared to chains of primary goods (Crang, et al., 2013). Second, it has contended that the analysis of discursive/semiotic dimensions of waste represents a productive device to understand how meanings in general (Hudson, 2005) and regulatory frameworks in particular (Lepawsky, 2012) assemble specific regimes of value creation as well as reinforce particular practices of wasting and valuing. Third, it has suggested that the extraction of value is crucially linked to the material properties of waste (Pickren, 2015). Fourth, with specific regards to informal recycling, it has shown that small and medium enterprises, rather than large transnational corporations, dominate the trade (Gregson et al., 2012). Finally, it has demonstrated that the labour process is the pivotal element in the formation of specific circuits of waste and therefore a potent foil to understand the creation, enhancement, and capture of value under capitalism (Herod, et al., 2013; Wong, 2015).

This research has theoretically interrogated GVC/GCC/GPN frameworks and proposed a number of variations on the theme such as global recycling network (GRN), global destruction network (GDN) and the like (Crang et al., 2013; Herod et al., 2013; McGrath-Champ et al., 2015). As suggested by Mike Crang, an open question remains as to what extent these networks are 'stabilised or transformed over time, whether they are replicated in other places, notably in China, and whether or how global recycling flows are in turn affected by attempts to enhance recycling activities within western economies' (Crang, et al., 2013, p.22). This chapter aims at contributing to fill this gap, giving accounts of local networks of waste recycling in Beijing. Firstly, although literature on the geography of waste (Moore, 2012) has provided rich empirical accounts in different contexts, when it comes to the understanding of the waste trade the idea of unidirectional flows from the global north to the global south still remains dominant. However, recent literature has suggested that the bulk of the trade is characterised by south-south dynamics and significant regional dimensions (Lepawsky, 2015). Secondly, as literature on regional studies has clearly pointed out (Scott and Storper, 2003), in the analysis of globalisation the understanding of regions as 'foci of economic activity' is of central importance (Coe et al., 2004, p.468) to comprehend the different ways GPNs are held down in specific places.

Indeed, scholarship has suggested that the 'strategic coupling' between global networks and regional assets 'stimulate processes of value creation, enhancement and capture' (Coe, et al., 2004, p.469). Literature on waste in China has engaged with this issue. For instance, Tong and Wang (2004) showed that the rapid growth of e-waste (Waste Electrical and Electronic Equipment and WEEE) recycling in southern China in the 1990s was trigged by the fact that Chinese 'entrepreneurs depended on imported WEEE both for material recovery and product refurbishment for the local market' (Tong et al.,

2015, p.33). This feature represents, however, only one of the three conditions that, according to Coe, et al. (2004), are needed to foster regional development, the others being the existence of economies of scale and scope within specific regions and the possibility of localisation economies. This chapter mainly focuses on these latter aspects. Here, rather than adopting a sectorial perspective, i.e. focusing on a specific category of waste, I rather adopt a territorial perspective. This strategy is embraced to highlight the geographical, socioeconomic and cultural elements that underpin the material processes of recycling, in other words the social relations of production that characterise waste recycling in Beijing.

Firstly, drawing on the work by Gregson, et al., (2012) on territorial agglomeration and industrial symbiosis, I contend that circulation of waste in Beijing, when analysed from a territorial perspective, reveals an organisation of production anchored in regions that are both sites of external economies and a locus of 'relational assets' (Storper, 1997). This does not oppose a topological reading of places (Amin, 2004), rather it proves that cities and regions are heterogeneous and multiscalar geographies. I thus introduce the concept of *local informal system* (LIS). Rather than being a new framework, LIS is a reiteration of the Marshallian *industrial district* (Becattini, 2000; Grossetti, 2004; Hirst and Zeitlin, 1991; Marshall, 1890; Piore and Sabel, 1984; Storper and Scott, 1992) informed by insights from labour geography (Herod, 1997). I analyse agglomerations in the informal economy and their changes over time. I argue that informal recycling in Beijing is structured in a highly competitive and organised system, which evolves under the pressure of internal forces and external changes in the environment similar to the dynamics of the industrial district, but with a number of characteristics peculiar to these systems. Secondly, I draw this research into conversation with analytics on variegated capitalism (Jessop, 2011; Peck, 2013; Peck and Theodore, 2007). As pointed out by Martin Hess, literature on

GPN has not dealt in great detail with variation and diversity of capitalist formation in the global south (Hess, 2013). Coe and Hess suggest that:

> 'understandings of GPN dynamics need to be meshed with theorisations of the local and national 'varieties' of capitalism that continue to characterise the global system to produce what Peck and Theodore (2007) call 'variegated capitalism'. Put another way, the networked GPN perspective needs to be combined with territorial or placed-based interpretations of economic systems, for it is the intersection of these dimensions that is critical for labour and development, and the influences run in both directions (Hudson, 2007).' (Coe and Hess, 2013, p.7)

I thus contend that waste is a productive lens to analyse this issue and I suggest that the circulation of waste in China has 'settled into institutional foundations of its own, and therefore requires analysis on its own terms' (Schneider 2008, p.4, cited in Hess, 2013). Therefore, my main argument is that ongoingness in economic activity is a process strictly linked with capitalist dynamics and its analysis reveals important insights into the nature and heterogeneity of contemporary modes of production. I thus contend that a LIS represents a 'sub-model' of capitalism (Zhang and Peck, 2014). Here the term 'sub-model' does not refer to something outside the formal capitalist economy but rather to a system engrained and linked with formal capitalist economy. The chapter is organised as follows. In the first part I develop the socioeconomic notion of LIS. In the second part I apply this concept to the specific case of informal recycling in Beijing. Here, I give account of two 'waste markets', *Dongxiaokou* and *Xiejia*, which were respectively the main markets for raw material and electronic appliances in the metropolis. Finally I draw conclusions.

LOCAL INFORMAL SYSTEM

Variegated Capitalism, Industrial Districts, and Invisibility

In recent years, the 'variegated capitalism' approach (Jessop, 2011; Peck, 2013; Peck and Theodore, 2007; Polanyi, 1944), developed as a reaction to studies on "varieties of capitalism" (Hall and Soskice, 2001), has become an influential framework in economic geography. This approach has provided a potent tool to analyse the diverse and multiscalar nature of contemporary capitalism, and to move beyond problematic dichotomies that questionably classify world capitalisms in liberal market economies (LME) and coordinated market economies (CME). Studies on China, adopting this framework, have also grown in number. Yet not many works, to my knowledge, have investigated this country at a deeper scale than the regional one (Chang and Sheppard, 2013; Lim, 2010; Lim, 2014; Mulvad, 2014; Zhang and Peck, 2014). Moreover, this research has exclusively focused on the formal capitalist economy (Williams et al., 2012), failing to recognise the importance of the informal activities, which much participate in the economic geography of China (Huang, 2009). This chapter fills this gap through a detailed analysis of a local informal economy specialised in the trade and treatment of waste products. In doing so, I introduce the framework of Local Informal System, constructed upon the concepts of *Industrial District* and *invisibility*, borrowed from economic sociology and labour geography.

As Ray Hudson (2011) correctly pointed out, studies on diversity of capitalism intersect industrial district scholarship on the theme of 'regionalised capitalism' (Trigilia and Burroni, 2009). Here, the focus is on the interplay between national and regional scales that are understood to be dialectically influencing each other and bringing heterogeneity

to local capitalisms. Embedded in urban structures, social settings, and local institutions, industrial districts highlight how economic organisation is characterised by internal diversity (Trigilia and Burroni, 2009). From this perspective, local economies are not only an outcome of modern capitalism, but spaces that contribute to its dynamics (Storper, 1997). Building on this argument, I suggest that informal recycling in Beijing, being organised in a division of labour consistent with the notion of industrial districts, reveals significant insights into the variegation of contemporary Chinese capitalism.

Considered as a retrogressive change or, at best, as a passing phenomenon, industrial districts (Marshall, 1890) did not receive much attention from politicians or scholars until research on the Third Italy (Bagnasco, 1977) brought about a revival of the concept in the seventies (Becattini, 1979; Becattini, 1962; Raffaelli, 2009). These years saw the world stricken with recession, rising unemployment rates and a general economic decline (Piore and Sabel, 1984). However, while regions dominated by the classic Fordist mode of industrial organisation, based on mass production and consumption, were suffering from the difficulties of the new economic environment, other parts of the world, characterised by agglomerations of small and medium firms, were flourishing (Piore and Sabel, 1984). Research on industrial districts built on a variety of approaches that includes Marxist theory, flexible specialisation, international business theory, transactional cost and institutional theory, and regional studies, which have been largely discussed in the literature[16]. In this chapter I principally draw on the concept of industrial district as outlined by Becattini (2000).

This scholarship suggests that industrial districts include a different number of industries, ranging from relatively technologically advanced to traditional labour-intensive ones.

[16] See for instance Asheim, B., P. Cooke, and R. Martin (2006).

They are dominated by agglomerations of interconnected firms that adopt a flexible specialisation to production and have, at the same time, a competitive and collaborative relationship between them (Perry, 2012). In this 'hybrid' model where tradition and modernity coexist (Belfanti, 2009), individual firms can rarely achieve internal economies of scale, as large vertically integrated units do. They can, nevertheless, benefit from *external economies*, a number of factors associated with flexibility and external to the control of a single firm, which boost the productivity of an industry or an entire geographical area (Storper and Harrison, 1991). Moreover, industrial districts develop a 'distinctive *savoir faire* which differentiates one system from another and is source of a competitive advantage' (Lorenzini, 2011, p.1445). This drives firms in the direction of pace innovation, which in turn underpins future growth (Porter and Ketels, 2009). Markusen (1996, p.298) summarises the socioeconomic characteristics of industrial districts as follows:

> 'A business structure dominated by small, locally owned firms
> A non-metropolitan, small town environment
> Relatively low scale economies relatively low
> A substantial intra-district trade among buyers and suppliers
> Key investment decisions made locally
> Long-term contracts and commitments between local buyers and suppliers
> Low degrees of co-operation or linkage with firms external to the district
> A labour market internal to the district and highly flexible
> Workers committed to the district, rather than to firms
> High rates of labour in-migration, lower levels of out-migration
> Evolution of a unique local cultural identity (sub cultural base)
> Shared values (hard work, cooperation)
> Specialised sources of finance, technical expertise, business services available locally
> Existence of 'patient capital' within the district
> Turmoil, but good long-term prospects for growth and employment'

This diverse set of characteristics suggest that the industrial district represents a social totality in which the economic and productive elements are always grounded in social

and cultural dimensions that continuously nourish and influence each other (Becattini, 2000). In fact, economic activities are always embedded in sociocultural contexts (Polanyi, 1944) and these dimensions are particularly evident in the role of the firm (Albert, 1991; Hall and Soskice, 2001). While under liberal market economies the firm becomes a commodity, the 'nucleus firm' (Becattini, 2000), in different places and at different scales enterprises are considered a lifetime plan. In the former case the firm is a way to valorise capital; where competitive relations between workers as well as individual interests are fostered against group interests, and low levels of redistribution occur. In the latter case, the firm is a totality for a human existence, which gives meaning to the life of local entrepreneurs who often engage in their projects with family and relatives (Sforzi, 2008). Here, more egalitarian and cooperative values prevail between workers and entrepreneurs (Albert, 1991).

These 'small masters' often invest the few means in their possession: savings, hard work, and reputation. It is through the loyal relationship with their peers that they realise 'irrational' projects, in the face of many difficulties and obstacles which they encounter on their way (Becattini, 2000). Only a few of these projects will eventually metamorphose into 'nucleus firms', commodities to valorise capital. From Becattini's perspective, the projects of these entrepreneurs find the ideal conditions to proliferate in the industrial district, which represents the socio-territorial entity where industrial specialisation becomes the organising element of a community of people and population of firms that tend to merge (Becattini, 2000; Becattini, 1979; Becattini, 1990; Becattini, 1987; Becattini, 1989). It is in this context that specific territories characterised by strong local identities brought about the development of agglomerations of firms in a climate of cooperation and competition. In my opinion, similar dynamics are evident in informal recycling in China.

The main characters of the story of Beijing recycling are individual collectors, small workshops artisans, family-owned firms entrepreneurs, and local shop owners. This is a phenomenon deeply embedded in a sub-cultural context that shapes the identity of a migrant community, sharing the same language, culture, origins, as well as values of hard-work and modesty. The reuse and recycling of valuable products by Beijing recyclers much resembles in many of its dynamics the socioeconomic notion of the industrial district (Becattini et al., 2009; Marshall, 1890)[17]. However, I also argue that informal recycling maintains specific features and a number of consistent differences that distinguish it from a local production system in both developed and developing countries (Wang, 2010; Wang and Mei, 2009). In fact, recycling actors in Beijing operate mainly outside official governance channels in the blurred area between formality and informality (Meagher, 2013; Tao et al., 2014) and sometimes in competition with official schemes. I thus suggest calling their organisation a *Local Informal System*. In this regard, I suggest that the central feature that shapes the concept of local informal system is the quality of *invisibility*, as defined in more detail in Chapter 6. Here it is therefore important to briefly contextualise informality and invisibility.

While I agree that formality and informality are not ontological given categories, but rather their edges are contested and produced in the course of struggles (Schindler, 2013), here I define informality as the broad range of activities outside official governance (Guha-Khasnobis et al., 2006) and in particular I refer to the definitions outlined by Kate Meagher. These are: the *informal sector* or 'the production and employment in unregistered enterprises'; the *informal employment* or 'the employment outside of the labour protection regulations of a given society, whether in formal or

[17] It is worth saying that this model is closer to the Marshallian industrial district than to the industrial cluster as portrayed by Porter and Ketels (2009).

informal firms'; the *informal economy* or 'all firms, workers, and activities that operate outside the legal regulatory framework of society, and the output that they generate'; the *informal institutions* or the regulatory arrangements 'outside of official sanctioned channels'; and the *informal markets* or the 'organisational arena in which informal economies operate, where labour, goods and services are traded' (Meagher, 2013). In comparison, invisibility refers to the social, political, and economic processes that bring about an uneven access to resources and labour. In this regard, a LIS is an *invisible space* and refers to a number of diverse characteristics that encompass the absolute, relative and relational dimensions of space (Harvey, 2006; Lefebvre, [1974] 1991). Therefore, invisibility is a device to define the patient capital of Beijing recyclers, and a metaphor (Dematteis, 2010; Dematteis, 1985; Fall and Minca, 2013) to describe the marginalisation of local informal systems. The positive potential of informal activities is often hidden under a layer of stereotypes (Tao et al., 2014). As a result, while providing a fundamental service, Beijing recyclers are often marginalised. Their activities are rarely promoted by local authorities, which often follow a different path of development (Lora-Wainwright, 2016). As a result, invisibility is a characteristic that highly differentiates LIS and industrial districts.

In recent decades, industrial districts have been increasingly investigated and integrated in the action of policy circles. State intervention has been a significant factor for industrial district formations (Park and Markusen, 1995), through the enactment of policies to foster the development of these systems in different geographical, social and political contexts (Perry, 2012). A large network of institutions such as universities, vocational training providers, trade associations, local agencies, think tanks, administrations and so forth support local production systems in general, and industrial districts in particular (Perry, 2012). This has helped to create robust organisations of 'independent and informally linked companies and institutions' that contribute to boosting the 'efficiency,

effectiveness, and flexibility' of these systems (Porter, 1998, p.80). In contrast, the invisibility of a local informal system usually results at best in a tacit tolerance on the part of the authorities, or at worst in an open opposition. Collaboration with local institutions such as administrations or research centres is therefore rare, with very few exceptions, and almost always on an informal base and outside regulatory frameworks. I therefore argue that a striking difference exists between local informal systems and industrial districts.

Social and environmental problems exist in the informal economy and these inevitably result in an uneven displacement of risks and social injustice for the weakest members of the community. As pointed out by a well-known Chinese scholar close to policy circles, 'institutions[18] should bear the responsibility' of addressing these issues and 'subsidise informal recyclers to solve their problems' (personal communication). While I agree with the statement above, I understand that a stronger state intervention in support of informal recycling is needed in China, as often elsewhere, and I think that more empirical studies and rigorous theorisations are required to address these issues. As pointed out by Kate Meagher, more works mapping the value chains of informal activities are needed to 'advance policy approaches capable of ensuring a more equitable distribution of benefits across the formal-informal divide' (2013, p.28). It is my aim to offer a preliminary contribution in filling this gap. In the next section, I turn to my empirical findings to address this issue and further unpack the concept of Local Informal System.

[18] Literally the government (政府).

INFORMAL RECYCLING IN BEIJING

In this section I apply the concept of Local Informal System to the specific case of informal recycling in Beijing and I give an account of the two waste markets of *Dongxiaokou* and *Xiejia*.

Mapping Beijing Recyclers

As described in Chapter 3, until the end of the seventies an official system for the collection, treatment and recycling of urban and industrial waste was in place in China under the planned economy (Béja et al., 1999; Tang and Feng, 2000; Tang and Feng, 2002). At the time, the system was organised into different levels of management, articulated in local collection points, sorting stations, and recycling and treatment companies (Tang and Feng, 2000; 2002). However, after the introduction of the reforms, opening up policies and consequent marketization process, this system broke down. State-owned companies gradually retreated from providing the service under the pressure of market forces, and the centrally-planned system was finally dismantled, providing new business opportunities to a broad range of different actors (Tao et al., 2014). From the end of the nighties onwards, central and local governments implemented regulations as well as a number of formal schemes for the management of different streams of recyclable waste (Tong et al., 2015; Wang et al., 2008). However, to date the bulk of the industry in Beijing is still dominated by what is usually labelled as the informal sector (Chi et al., 2014).

At the end of the 1990s, two Chinese researchers, Feng Xiaoshuang and Tang Can, as well as two French academics Jean-Philippe Béja and Michel Bonin, investigated waste recycling in Beijing and produced two articles in Chinese (Tang and Feng, 2000; Tang and Feng, 2002) and one long paper in French (Béja et al., 1999). In particular, the research described and analysed a migrant community of recyclers established in the northern rural-urban fringe of Beijing that the researchers called, inspired by the works by Xiang (2000) and Shi (1992), the *Henancun* or the *Village du Henan* (the Henan village). At the end of the nineties, the migrant community from the province of Henan province had developed the area into a complex network of interrelated recycling activities. Having arrived in Beijing with almost no capital at all (Tang and Feng, 2002), this group of migrant workers rapidly built a complex social and economic system (Béja et al., 1999; Tang and Feng, 2000). While they constituted a population at the bottom of the Chinese urban society, they nevertheless operated a 'second differentiation' inside their relatively homogeneous community. Different classes, diversified by a number of subcategories, appeared in the village: the *chiffonier*[19], the road collectors[20], the warehouse workers[21], and the warehouse managers[22]. The research conducted by Feng Xiaoshuang, Tang Can, Jean-Philippe Béja and Michel Bonin represents a source of important insight and knowledge. However, the economic analysis of this work remains confined to the boundary of the Henan village, and is essentially mono-scalar. This leaves open a number of important questions concerning the linkages between the Henan village and the overall economy, and the issues concerning their change over time.

Since the 1990s, informal recycling has not only grown in scale but also in complexity. In 2004 the municipality of Beijing already counted more then 120 collection markets (集散

[19] Ragmen, 捡破烂儿.
[20] 沿街收购者.
[21] 货场雇工.
[22] 货场经营者.

市场) in the metropolis (Mofcom, 2004). Every collection market was, in its geographic and social dynamics, similar to the Henan village described above, yet they were also part of a complex urban economy. Collection markets, more commonly known as waste markets, are usually located at the rural-urban fringe of metropolises and their evolution over time is strictly connected to the urbanisation process of the metropolis as I show in the following chapter. In some markets a wide variety of products is traded. This was for instance the case of Dongxiaokou. In contrast, other markets are specialised in the collection of a limited number of products. This was the case of Xiejia, which was specialised in electronic products. As pointed out by Tao (2015), waste markets are elements of a complex system that covers the entire territory of Beijing and has economic linkages that go beyond the boundary of the metropolis, reaching regions near and far. This is articulated in different scales, from the local[23] to the regional, national, and global. At the local scale, the first actors of the value chain are households and businesses, such as restaurants and construction sites, which produce waste collected by *scalvangers*[24] and scrap dealers. These are individual self-employed traders (个体户/个体经营), who move throughout the different neighbourhoods of Beijing, collecting or buying a wide range of products.

[23] Here, this term refers to the households' scale.
[24] Waste scavengers and individual collectors, see Kirby, Peter Wynn and Anna Lora-Wainwright (2015).

Figure 1. Waste markets in the outskirts of Beijing



Individual collectors in Beijing represent an army of hundreds of thousands of people equipped with a variety of means such as bicycles, tricycles and small trucks (Zhang and Wen, 2014). According to field observations, they usually have one of three major clients: small local markets and warehouses in central Beijing, larger markets in the suburbs such as Dongxiaokou, or manufactures in other regions. While the first option is the most common, it is, at the same time, the least profitable. In contrast, the latter two, while being more profitable, are often the most difficult to achieve for logistics reasons. A number of coordination issues need to be solved in order to reach economies of scale. Nevertheless, this is not a rare phenomenon, notably for collectors of small electronic appliances such as mobile phones, as described in Chapter 6.

Figure 2. Individual collectors



The second group of actors on the local scale are the 'street trading points' (Linzner and Salhofer, 2014), small markets that are commonly found on street corners in central neighbourhoods. These are family owned businesses buying products from individual collectors or collecting them directly from local households and businesses. These local businesses gather a variety of products. Nevertheless, it became evident during my fieldwork that a certain degree of specialisation had already started to appear at this scale. These actors usually resell their products to other intermediaries in waste markets in suburbs or, as I have recorded in my fieldwork, to direct clients in nearby regions.

Figure 3. Small warehouse in central Beijing



Moving up the value chain, there are waste markets (废品市场), also called collection markets (集散市场) or recycling markets (回收市场). Located at the rural-urban fringe of Beijing, waste markets are agglomerations of recycling enterprises as well as complementary businesses. In my opinion, the similarities with the dynamics of the industrial district are most evident in these spaces, where external economies are realised through the competition and coordination between firms. I contend that waste markets

represent nodal points of governance in LIS and are the place for a number of power asymmetries.

According to my field observations, waste markets have a large number of buyers and suppliers such as individual collectors, logistics actors, manufacturing companies, second-hand shops, formal recycling companies, producers, and so forth[25]. These actors, from Beijing or nearby regions, carry out their activities linking the formal and informal spheres of the economy. Waste markets are also the space where labour and capital meet and where complementary businesses such as logistics operators or small mechanics flourish. Ongoingness of economic activity is most visible here. Products are stored, sorted, treated, and traded.

Figure 4. Waste or commodity?



Not only does waste metamorphose into a commodity through the process of exchange when 'different products of labour are in fact equated with each other, and thus

[25] This is the case for e-waste, as we will see in the following sections.

converted into commodities' (Marx, [1867] 1976), but new value is objectified through the labour process into refurbished products and processed materials. Indeed, while circulating through what Herod et al. (2013) call global destruction networks, or through local informal systems, waste products show all the characteristics of commodities (Dagognet, 1999). To further analyse this point, in the following sections I provide an account of the waste markets of Dongxiakou and Xiejia.

Dongxiaokou – Relational Assets and the Power of Waste

Dongxiaokou (东小口村) is a former rural village in the northern suburbs of Beijing, just outside the fifth ring road and around ten kilometres away from the city centre. Before recyclers moved to the area, Dongxiaokou had a population of just under two thousand (Tao, 2015). This was mainly composed of local villagers and the employees of a state-owned company subsidiary of the construction group *Beijing Chengjian*, which had rented land from the village to build houses and dormitories for its employees in the 1980s (Tao, 2015). At the time of my fieldwork, Dongxiaokou was the biggest hub for the secondary processing of a great variety of materials, ranging from construction waste to waste garments. Thousands of enterprises were established in the area. The first wave of recyclers arrived in the early 2000s. This was connected with the redevelopment of the neighbourhood of Wali, where a previous agglomeration of recycling companies was located. According to Lao Wang, the son of a boss of one of the biggest markets in Dongxiakou, the majority of recyclers were still operating on a small scale at that time. As the redevelopment project of Wali, promoted by Beijing authorities, drove recyclers away from this area, a number of them started to look for a new location to establish their activities, which they found in Dongxiaokou.

At the time, Dongxiaokou was still a rural village where renting land was relatively cheap. In addition, the position of the village, as described in the following excerpt, was convenient for the establishment of recycling activities. This process was lead by a number of drivers that opened the way. As pointed out by Lao Wang, 'on the one hand to build a market you need the right conditions for success, on the other hand you also need a bit of courage' (personal communication). These leading recyclers took the responsibility for renting big plots of land from the village committee, applying for a commerce licence and realising a number of infrastructural works. According to Lao Wang, his family was one of the first to establish a market in Dongxiaokou,

> 'We spent more than two million Yuan. There were some people who gave us advice. They helped us to find a piece of land, and build a market. At the time we didn't have much money, so we borrowed it at a high-interest rate from relatives. […] After we arrived the house rents increased from a few tens of Yuan to several hundred, and then thousands. At the time the villagers were still very happy. But now, some of the villagers, who have earned a lot of money from us, want [the market to be] demolished. They believe that it is not essential [anymore], and also a risk for the environment.'

The account above underlines how labour in-migration, which characterised the early development of the agglomeration, became an element of friction within the village in the long run. Indeed, the establishment of waste markets brought about a rapid growth of the local population and a marked transformation of the physical space. Workshops and houses were just one part of this transformation. Warehouse bosses lived with their families next to the yards where they stocked materials, workers slept in dormitories next to their working place, and children traversed the market to get to school every morning. Indeed, here 'the community of people and the population of firms […] [tended] to merge' (Becattini, 1990, p.38). Not surprisingly, this proximity made 'the mysteries of the trade become no mysteries' (Marshall, 1890).

Moreover, the account also highlights how this proximity also inevitably resulted in a number of contradictory dynamics. The immediate profit realised by villagers, who rented out the land, corresponded to the practical value of the land that recyclers used to create a geographical landscape favourable to the reproduction and valorisation of their capital (Harvey, 2014).

Figure 5. Activities in Dongxiaokou



As land and waste became an 'accumulation strategy' (Smith, 2007) for recyclers, this fact increasingly confronted the original population of Dongxiaokou as an environmental externality. Indeed, over the course of a few years the small rural village became a major hub where industrial and urban functions mixed together as in a classical nineteenth century industrial district, with all the benefits and drawbacks of this transformation, and this profoundly changed the physical landscape and population of Dongxiakou. Indeed, as described in the following account, Lao Wang divided his land into different plots and

on each of them built a house with a small yard to stock materials. He then started to sublet the lots to individual merchants,

> 'our market is around 60 or 70 *mu* (亩)[26]. […] after we built the market we started to look for merchants who wanted to relocate their activities here. Very quickly we found them, mainly relatives and friends. At the beginning the rent of one yard was around two or three thousand Yuan. Now it is around four or five thousand. This process was extremely successful. Other people saw this and rented some land next to ours, and established a market. At the peak, there were eight to ten markets. The main market bosses were all from Gushi.'

As described in the account above, the support of fellow recyclers, mostly friends and relatives, who formed a so-called *guanxi* network (Yeung, 2004), was the element that enhanced the success of Lao Wang's action. This sociocultural community not only tied together the economic system, but also effectively played the role of an informal institution, where conventions and relations enabled 'evolutionary processes between organisations and technologies to unfold' (Storper, 1997, p.48). While it is a well-known fact that economic activity is embedded in social relationships and cultural norms, it is the significance and status of these elements that becomes crucial for the understanding of economic performance (Clark 1997). In this regard, according to Storper (1997) noneconomic forces should be understood as information that underpins the coordination of economic actors. 'When actors undertake an activity, they do so with the expectation that they have a framework of action in common with other actors engaged in that activity' (Storper, 1997, p.45). Such a pragmatic force drove the establishment of the waste market, which resulted in a new hybrid socioeconomic organisation. Here, on the one hand horizontal relationships between recyclers, based on collaboration and competition, shaped the economic life of the system. On the other hand, this was ingrained in a hierarchical structure, where a few lead actors, who have built their power

[26] 1 *mu* is around 615m^2.

on clientelist practices and social connections (Zhang, 2001), played a central role in making key investment decisions, fostering innovation.

During my fieldwork, between September 2013 and December 2014, only six big markets, managed by four different bosses, were still present in Dongxiaokou, each of them sheltering hundreds of companies. Redevelopment projects had already brought about the demolition of other businesses. Each remaining market was located on the main street of the village, *Xixiaokou lu*, renamed *Wuting lu* (舞厅路) or 'ballroom road' due to its poor condition that, as the name suggests, made trucks and cars dance on it.

Figure 6. Wuting lu – 'ballroom road' in Dongxiaokou



Xiejia – Industrial Symbiosis and Materiality of E-waste

The waste market of Xiejia has a story that dates back to the end of the 2010s. It was situated close to the residential area of Tiantongyuan in the northern east suburbs of Beijing, around 15 km north of the city centre and 6 km east from Dongxiaokou. According to Lao Liu, the son of one of the bosses that first invested in the market, Xiejia was the biggest hub for the refurbishment and recycling of electronic products in Beijing until its demolition in early 2015. The family of Lao Liu moved to the area in late 2006 and invested their money together with the savings of other two families.

> 'We moved to Xiejia in 2006. […] At the time it was extremely far from the city centre. There were no buildings, no people, and no cars. […] We invested 20 million Yuan with some friends. Three families. Only one family didn't have all this money.'

Similarly to Dongxiaokou, the birth of Xiejia was the result of a few pioneers. After the establishment of the market, Lao Liu provided a number of services for the subcontractors, such as coordinating activities between merchants and local officials, and also played a central role in coordinating the relocation of the community in the months preceding the demolition of the market in early 2015. He negotiated the time and terms of the relocation with official authorities, and in a number of meetings held at his house, Lao Liu kept the community informed about the progress of these negociations.

Interestingly, the family of Lao Liu 'moved to Xiejia from Dongxiaokou'. The birth of this new market can be understood, therefore, as a spin-off of the previous agglomeration. Informal markets, as territorial economies, are pragmatic outcomes of intentional human activity (Storper, 1997), and as a result they come about in different patterns of coherence. In this regard, a particularity of Xiejia was the specialisation in the

recycling of electronic products. Lao Liu explained that this specialisation was a strategic choice because 'electronics bring more money'. As a result, while in Dongxiaokou different markets were treating a variety of waste products, basically covering the spectrum of all possible recyclables that can be found in Beijing, in Xiejia almost every business was specialised in electronic waste, as I witnessed during my fieldwork and as it was confirmed by Lao Liu,

> '[In Xiejia] there are around 200 workshops. Each family has around five or six members. In total there are around 1000 people. They all deal with electronic products, except two workshops. One collects metals and the other plastics.'

In Xiejia, workshops were literally situated under the same roof. This proximity triggered dynamics of competition and cooperation, and was both an outcome and a cause of the economic specialisation and coordination of different entrepreneurs. Here, the key activity was the refurbishment of large electronic products such as refrigerators and washing machines. For this reason, 'functional value' of end-of-life appliances was the main driver of business (Chi et al., 2014; Orlins and Guan, 2015). This specialisation resulted in a competitive advantage, which drew on a number of external economies and relational assets of the market. Moreover, the presence of complementary businesses, such as workshops for material recovery of metals and plastics, also resulted in an additional advantage for the agglomeration. While a flow of materials entered Xiejia in multiple forms, processes of industrial symbiosis (Gregson et al., 2012) boosted the potential of the system with a high division of labour and technical skills. As suggested by Orlins and Guan (2015), while rural migrants in China engaged in recycling activities tend to have a poor educational background, they nevertheless represent a group of skilled workers. This labour force, as pointed out by Lao Huang, a recycler in Xiejia, is trained in the field,

> 'most of us have studied on our own. Being together we can learn from each other everyday. […] We are very good at this job. Even Haier and Samsung send their technicians here to seek help.'

This statement, besides emphasising the pride of these skilled artisans, highlights two major points: creation of linkages and circulation of knowledge. While it is clearly difficult to verify whether producers truly send their technicians to learn from these skilled artisans, the quote above suggests that linkages between formal and informal activities are a common practice in the industry.

Figure 7. An artisan at work in Xiejia



As observed in the field, a number of electronics manufacturers often resell flawed products that cannot enter formal distribution, but that can be easily (re)valorised in informal markets (personal communication). Fieldwork observations also revealed that formal recycling companies specialised in material recovery often purchase resources from informal markets, as clearly confirmed by the manager of one of these enterprises in Beijing (personal communication). In fact, the collection methods of large-scale

companies, focusing on material value rather than functional value, drive only a limited number of end-of-life appliances into formal channels (Schulz, 2015). Here, both material and semiotic dimensions are at play. Different meanings that consumers give to end-of-life commodities, e.g. as waste or bearers of value, trigger the penetration of alternative circuits of capital and flows of materials (Hudson, 2005). Futhermore, besides the aforementioned interplay between price and value determined by both the material and semiotic dimensions of discards, the intrinsic value of waste and recycling, crystallised in conventions and social relations, also plays a central role in diverting products towards the informal economy. Sociocultural elements not only mediate the labour process and the transformation of materials but also regulate the flow of knowledge. Indeed this 'community of specialists' (Storper, 1997, p.109) developed an exclusive know-how and technology that is costly and time consuming to reproduce in different contexts such as large-scale and machinery industries. This fact characterises refurbished appliances as a peculiar variety of *specialised* products (Storper, 1997). Moreover, these commodities appear to be oriented towards a particular kind of client. Buyers in Xiejia were mainly second-hand shop bosses, often tied to recyclers by familial relationships or friendship. For instance, Lao Liu's younger brother was the owner of a shop in the second-hand market of Shuangquanbao, situated not far from major Beijing universities, whose clients were mainly composed of students and lower socio-economic groups that paid him constant visits. As a result, refurbished products did not correspond to an anonymous market merely ruled by supply and demand dynamics, but were a special kind of *dedicated* product for a chain of clients ingrained in interpersonal relations (Storper, 1997, p.109). Therefore, the socially embedded nature of this trade characterises informal recycling as an industry deeply-rooted in contemporary Chinese society.

Figure 8. A transaction in Xiejia



These simple facts outline how this complex territorial industry, which I define as a local informal system, represents a distinct form of local capitalism, institutionally mediated and socially embedded. This system has the capacity to create linkages between formal and informal spheres of the economy, and in so doing, couples with global production networks, capturing and enhancing value. In the following session I push forward this analysis focusing on a number of internal forces and external threats that contribute to the change of these systems over time.

Internal Forces and External Threats

The review of the two waste markets outlines a number of similarities and differences with the classical model of the industrial district (Becattini, 1990) that are worth analysing in more detail. First, concerning the creation of markets as well as their relocation, it is evident that in both 'waste markets' the origin is the result of a 'key investment decision made locally' (Markusen, 1996, p.298). However, this fact also outlines a particularity of this process. The central role played by a few drivers is pivotal to particular social relations. Unsurprisingly, market bosses have a great influence on the fate of markets as a whole as well as on the fortune of single businesses of individual recyclers and subcontractors. Moreover, the role of market bosses as mediators between the community of recyclers and official administrations certainly creates hierarchical structures that make this system a hybrid model, where both horizontal and vertical relationships exists between firms. Interestingly, this dynamic seems to mirror the shift from trust-based to leadership and formal government relationships in industrial districts that face new challenges in a globalised economy (Cutrini et al., 2012). However, while this dynamic in Europe is triggered by external causes, the hierarchical relations between firms in waste markets are determined by internal forces that I believe belong to the realm of invisibility, as described in previous pages. The central role assumed by market bosses results therefore in a strong power asymmetry with other groups in the community.

In the accounts above, there are also insights into the access to credit, a mechanism that underpins innovation in the industry. In both cases, in order to find financial resources, the two families turned to the local community, although the strategies adopted were slightly different. The family of Lao Wang 'borrowed money at high interest', in contrast

to Lao Liu who decided to find partners for his investment. While both strategies were eventually successful, risks and benefits were obviously different in the two cases. These practices share some similarities with dynamics in industrial districts, where the access to credit for small and medium enterprises is often very difficult. To respond to this challenge, industrial districts usually develop a 'local credit system' (Becattini, 1990, p.47). Here a local bank 'born and bred' in the community (Becattini, 1990, p.47) provides credit to local entrepreneurs. Decisions are usually informed by knowledge of the prospects of projects and personal qualities of entrepreneurs who ask for credit: the kind of information that bigger organisms, not involved in the life of the district, cannot obtain. A similar role played by the 'local bank' is performed in LIS by some members of the recycling community who lend '[money] at high interest'. While elements of usury are evident, I believe that this practice is better understood as a mechanism of endogenous shadow banking (Elliott et al., 2015; Tong, 2014) which plays the role of a 'specialised source of finance' (Markusen, 1996, p.298) for recyclers that cannot access the official credit system. These underground financial institutions provide credit to members of the community, and are often connected through kinships and friendships. However, while this practice boosts the development of new businesses, it also represents a major threat. When this internal mechanism pairs with external threats the connection can become extremely disruptive, as described in the following account by Cai Shifu, a small recycling entrepreneur in Dongxiaokou:

> 'in 2008, many became rich, but others lost a fortune. Some fellow villagers hanged themselves. At first, because they saw that the business was good, they invested fifty or sixty thousands Yuan. Some even borrowed hundreds of thousands of Yuan from relatives. The result was that during the second half of the year the market collapsed. If you sold, you lost money. If you didn't, well, you also lost. With all that money [borrowed], well, they just hanged themselves. There were actually a lot of people who did this.'

Stories of successful recyclers attracted new investments making the scale and scope of waste markets grow. However, their vulnerability depended on these same dynamics. The story behind the account above exemplifies this clearly. In the first half of 2008, traffic restraint policies for the Beijing Olympic games resulted in a slowdown of the circulation of raw materials. The skyrocketing prices of commodities pushed a number of entrepreneurs to invest, while informal institutions provided easy access to credit. However, in the second half of 2008, when the traffic restraint policies ended, prices of raw materials plummeted. Moreover, this trend was intensified by the general stagnation of the economy due to the international financial crisis (Lora-Wainwright, 2017). The effect was dramatic, as shown in the account above.

While the birth, growth and decline of waste markets, as in industrial districts, can be traced to specific historical circumstances (Porter, 1998), internal forces and external changes in the environment influence the development or decline of these informal systems to degrees that reflect the invisible nature of their activities. On the one hand, waste markets represent an opportunity for capital to realise productive 'institutional and spatiotemporal fixes' (Jessop, 2014) and set waste and value in motion. On the other hand, their exposure to environmental, economic, social and political shocks make these local economies places where capital is recurrently subjected to destruction, as I will demonstrate in the following chapter.

CONCLUSION

Recent geographical research on waste has interrogated GVC/GCC/GPN frameworks to examine the circulation of end-of-life commodities and to challenge unidirectional and

linear notions of economic activity. Focusing on political economic, semiotic and material dimensions of waste, these studies have outlined how discarded products traversing different networks contribute to the beginnings of new rounds of commodity production. Drawing on this literature, I have contended that the circulation of waste, as value, has to be understood has a process immanent to contemporary capitalism. Therefore, the analysis of how economic activities around waste are organised in time and space has much to tell about the variegation and heterogeneity of modes of production. In other words, the appropriation of waste is a process that generates the penetration of alternative mechanisms of value creation, enhancement and capture. This is because the dynamics that bring regional recycling economies to hold down global networks are always affected by different geographical, institutional, and political contexts.

Therefore, the analysis in this chapter has focused on networks of informal recyclers in Beijing, and particularly on the two waste markets of Dongxiaokou and Xiejia, to show that the organisation of production of this local economy has set institutional foundations of its own that greatly differ from a supposed mode of global production or a particular variety of Chinese capitalism. I suggested that besides economic rationales, local recycling economies in Beijing are shaped by intrinsic and contingent values of waste and recycling. These noneconomic forces refer to cultural conventions and social relations that coordinate the action of a community, and result in a series of external economies and 'relational assets'. I thus analysed this recycling economy through the notion of local informal system. This idea builds on the concept of industrial district. However, I suggested, drawing on labour geography, that the main characteristic of invisibility highlights differences between these two concepts. I contended that while official institutions have increasingly supported industrial districts, this is not the case for

local informal systems, which rely on informal institutions to underpin coordination of economic actors and to enhance economic performance.

The example of the agglomerations of Dongxiaokou and Xiejia showed some of these features. Noneconomic forces greatly contributed to the establishment of the two markets, not only tying economic activities together but also playing a central institutional role. These included the access to credit of recyclers, which was mediated by underground institutions; the networks of kinship and friendship that embedded the trade in chains of clients and interpersonal relations; and cultural norms that influenced the territorial division of labour promoting dynamics of competition and collaboration as well as processes of industrial symbiosis. Major environmental and social externalities unquestionably exist in informal recycling. However, the stigmatisation and marginalisation that derives from this fact usually masks the positive potential of the industry. Informal recycling often delivers fundamental services, generates employment opportunities, provides cheap products to lower classes, and contributes to addressing poverty reduction. These assets represent intrinsic values that transcend material dimensions of waste and make this industry an economic activity deeply-grounded in society. Analysing this phenomenon through the lenses of the labour process and the heterogeneity of capitalist formations is therefore useful in unfolding the struggle of people who work in this industry, fighting for a better life.

THE ENCLOSURE OF 'WASTE LAND'

RECYCLING, URBANISATION AND ECOLOGICAL DOMINANCE IN BEIJING

CHAPTER 5

'Dove portino ogni giorno il loro carico gli spazzaturai nessuno se lo chiede: fuori dalla città, certo; ma ogni anno la città s'espande, e gli immondezzai devono arretrare più lontano' [27]

Italo Calvino, *Le Città Invisibili*, (1972, p.55)

INTRODUCTION

Two images borrowed from literature frame this chapter and guide me in thinking about the relationship between urbanisation, waste and dispossession. The first comes from the Hoovervilles of the great depression that John Steinbeck describes in the *The Grapes of Wrath*, which I briefly quote below.

> 'He drove his old car to Hooverville. He never asked again, for there was a Hooverville on the edge of every town. The rag town lay close to water; and the houses were tents, and weed-thatched enclosures, paper houses, a great junk pile. The man drove his family in and became a citizen of Hooverville – always they were called Hooverville. The man put up his own tent as near to water as he could get; or if he had no tent, he went to the city dump and brought back cartons and built a house of corrugated paper. And when the rains came the house melted and washed away. He settled in Hooverville […] and the little money he had went for gasoline to look for work. In the evening the men gathered and talked together. Squatting on their hams they talked of the land they had seen.' (Steinbeck, [1939] 2000, p.245)

[27] 'Nobody wonders where, each day, they carry their load of refuse. Outside the city, surely; but each year the city expands, and the street cleaners have to fall further back' in Calvino, Italo (1972).

Steinbeck describes the hardship that farmers in the southern region of the United States experienced during the years of the great depression, through the story of a family of 'Okies' who moved to California in search of employment. In the thirties a series of severe dust storms repeatedly destroyed crops fields in southern states. Small producers defaulted on bank loans and had their land requisitioned. Hordes of farmers moved west in search of work. When arriving in new states, they usually gathered into shaggy settlements, which soon became known as Hoovervilles. Hoovervilles were typically situated at the fringes of American cities, and sheltered men and women in basic dwellings made from discards. The second metaphor comes from the distant time of 'Le città invisibili', the *Invisible Cities* that Calvino published with Einaudi Editore in 1972. Calvino explores the invisible and the imaginable through the tales of different cities that Marco Polo describes to the Mongolian Emperor Kublai Khan. One of these cities is Leonia, the city that refashions itself everyday[28]. Here, citizens 'wake between fresh sheets every morning, wash with just-unwrapped cakes of soap, wear brand-new clothing, take from the latest model refrigerator still unopened tins, listening to the last-minute jingles from the most up-to-date radio'. In Leonia, street cleaners, who remove the impurities of the city in a respectful silence, are welcomed like angels, while 'nobody wonders where, each day, they carry their load of refuse. Outside the city, surely; but each year the city expands, and the street cleaners have to fall further back' (Calvino, [1972] 2010, p.102).

I remember when I first visited an informal recycling site in autumn 2013. My eyes were suddenly filled with unusual images. The village dripped from head to toe with waste and dirt. Houses emerged in between piles of junk. A thick layer of grime covered everything. Cans of soft drinks were turned upside-down in the local deli to protect them from the

[28] Jennifer Gabrys, in her book *Digital Rubbish*, evokes the same passage from Calvino. See Gabrys, Jennifer (2011).

ubiquitous dust. The remains of yellow insulating foam from dismantled refrigerators decorated the sides of the roads, where animals wandered in search of organic remains to eat. The noise of trucks transporting discards into the village resounded everywhere, while the smell of rubbish on fire was released freely into the air, filling up my nose and soaking deeply into my clothes. In the following month I discovered that places like the one describe above are quite common in China. Called waste or recycling markets, these places usually appear at the rural-urban fringes of metropolises. They are not dumpsites, rather the contrary. They are production sites, agglomerations of businesses specialised in the secondary processing of waste materials. Every kind of discard from construction sites, households or local businesses is exchanged. Waste wood, used plastic bottles, old newspapers, waste garments, computer motherboards, washing machines and the like are traded daily. In waste markets, not only does waste metamorphose into a commodity through the process of exchange, but new value is objectified through the labour process into refurbished products and processed materials.

Like the Hoovervilles described by Steinbeck, waste markets appear at the edges of large cities where migrant workers gather from rural regions. However, different from the shanty towns of the great depression, waste markets are not pools of an unemployed army of workers but places that thrive with economic activity. As I showed in the previous chapter, waste markets are nodal points of a socioterritorial entity, that I call a local informal system, built over the period of three decades by a migrant community sharing the same culture and values. Similar to the street cleaners of Calvino, the recyclers who inhabit these places bring their load of refuse outside the city, but every year have to fall farther back: the urbanisation process brought about the frequent demolition and relocation of waste markets, transforming recyclers into a nomadic population. To describe the struggle of these people, I discuss in this chapter the concept

of primitive accumulation (De Angelis, 2007; De Angelis, 2001; Federici, [2004] 2014; Harvey, 2005; Marx, [1867] 1976). I argue that Beijing recyclers are subjected to a twofold and ongoing process of dispossession. Besides the introduction of regulations and technologies resulting in the enclosure of the waste commons, urban forces also contribute to divorcing these people from their means of production. Recyclers are separated from the land where their activities are carried out and divorced from the very resource that contributes to their livelihood.

In doing so, I engage with recent debates on the nexus between primitive accumulation and the informal economy (Gillespie, 2016; Samson, 2015). Literature has provided important contributions highlighting the linkages between formal and informal activities (Meagher, 2013) and has challenged unidirectional understanding of the relationship between dispossession and informality (Samson, 2015). However, I contend that this scholarship has not yet offered sufficient arguments to conceptualise informality beyond the formal-informal divide. In this chapter I suggest that to overcome this impasse it is theoretically productive to engage with analytics on variegated capitalism (Peck and Theodore, 2007). Rather than identifying informality as the *other* of the formal economy, it can be theorised as a specific circuit of capital or a variety of capitalism existing in an ecology of economic systems (Jessop, 2014). Following this line of argument, I particularly engage with the concept of ecological dominance (Jessop, 2014) and I contend that dispossession can be understood as the result of the uneven impact of different circuits of capital or varieties of capitalism. The chapter is organised as follows. In the first part I review literature on primitive accumulation and variegated capitalism. In the second, I turn to my empirical study and finally draw conclusions in the last section.

FROM PRIMITIVE ACCUMULATION TO ECOLOGICAL DOMINANCE

In volume one of *Capital*, Marx elaborates the notion of primitive accumulation and defines it as the 'historical process of divorcing the producer from the means of production' (Marx, [1867] 1976, p.875). Marx argues that in early modern England this original appropriation of resources appeared in its classic form as the enclosure of rural land and enforcement of 'bloody legislation' against the expropriated peasantry. Orthodox interpretations of these pages have understood primitive accumulation as a historical process (Gillespie, 2016) with a 'clear-cut temporal dimension' (De Angelis, 2001, p.1). Perelman (2000) suggests that this reading is in part due to the first mention of primitive accumulation in Chapter 23 of *Capital*. Here, Marx, somehow echoing Adam Smith, gives a mythical aura to this notion, describing primitive accumulation as an original process that occurred 'once upon a time' and made the capitalist able 'to frequent the market as a buyer of labour-power' (Marx, [1867] 1976, p.714). As pointed out by De Angelis, Lenin's early works reflected this understanding of primitive accumulation as a passage between different modes of production (Lenin, [1899] 2004), a line of thinking that was also investigated by literature focusing on the mercantile age (Dobb, 1963).

However, the work of Rosa Luxemburg on expanded reproduction[29] lays the foundations for a different interpretation of this concept (Luxemburg, [1913] 2003). In *The Accumulation of Capital*, Luxemburg contends that to overcome underconsumption crises, capitalism relies on a set of economic and extra-economic mechanisms that are outside the sphere of capitalist production but 'concern the relation between capitalism and the non-capitalist modes of production' (Luxemburg, [1913] 2003, p.432). These

[29] I prefer here the term 'expanded reproduction' to 'enlarged reproduction', as the first formulation is largely employed in the literature.

consist of the exchange between spheres of the economy such as peasantry or small independent production (De Angelis, 2001), and the appropriation of surplus value through a variegated range of violent methods such as 'colonial policy, an international loan system […] and war' (Luxemburg, [1913] 2003, p.432). In this passage Rosa Luxemburg suggests that accumulation has a twofold character, one that concerns the capitalist market and the other that concerns the non-capitalist modes of production. David Harvey points out that this definition of accumulation is useful for a new reading of the concept of primitive accumulation. However, he suggests that it is necessary to go beyond the idea that relegates accumulation based on extra-economic mechanisms to an original stage of capitalism or outside of it (Harvey, 2005). Harvey argues that both economic and extra-economic mechanisms, such as fraud, predation and violence, are persistent elements of accumulation within capitalism (Harvey, 2005). As also pointed out by De Angelis, primitive accumulation is 'an inherent and continuous element of modern societies, [whose] range of action extends to the entire world', (De Angelis, 2001, p.3). It is therefore an ongoing and constituent process of capitalist relations and accumulation (De Angelis, 2007; Federici, [2004] 2014). To give account of this fact, Harvey suggests to reconceptualise the notion of primitive accumulation and to substitute it with the term of 'accumulation by dispossession' (Harvey, 2005, p.144). Following this line of thinking, in this chapter, I employ the term accumulation by dispossession, or simply dispossession, to refer to ongoing processes of primitive accumulation and enclosure under capitalism.

A corollary of the argument outlined above is to call into question the link between primitive accumulation and the shift to wage labour. While classic readings bound up the 'setting free' of surplus population with the emergence of new social relations of production, i.e. wage labour, the concept of accumulation by dispossession does not do

so (Li, 2010; Samson, 2015). Indeed, as pointed out by Glassman (2006), capital does not always benefit by full proletarisation, since this would imply to pay the full costs of social reproduction. Samson (2015) notes that this phenomenon is particularly true for the informal economy. Indeed, not all the people dispossessed of their means of production turn to wage labour, but some of them enter the informal economy to make a living (Samson, 2015). Unsurprisingly, different interpretations of this phenomenon exist in the literature. As pointed out by Lora-Wainwright (2016), informal activities, being at the same time pre- and post-industrial in their character, elude easy categorisations. While orthodox Marxisits understand their emergence as a sort of pre-capitalist delay (Moore, 2004), for Sanyal the informal economy represents an endogenous and necessary product of capitalist development (Sanyal, 2007). The Indian political economist suggests, therefore, that informality is a form of social protection for people excluded from formal employment. Yet he also contends that the circulation of commodities in the informal economy reflects a similar logic to pre-capitalist commerce[30]. It follows that surplus value is not created in the sphere of production, but rather by alienation, i.e. by 'buying cheaper and selling dearer' (Wood, 2002, p.78).

However, Samson (2015) shows, building on Gidwani and Wainwright (2014), that Sanyal's reading implicitly reinforces narratives on the formal-informal divide, failing to recognise the numerous linkages between the two spheres of the economy. I also believe that this analysis underestimates the complexity of the informal economy, which also employs wage labour and captures surplus value during production. By contrast, Samson suggests a more nuanced understanding of the relationship between accumulation by dispossession and the informal economy. According to this scholar, individuals often

[30] Building on a famous passage of *Capital*, Sanyal argues that in the informal economy commodities circulate in the form of commodity-money-commodity circuit (C-M-C), rather than moving in the capitalist circuit of money-commodity-money (M-C-M').

strategically chose to move from formal to informal activities, and vice versa, and intentionally create linkages between formal and informal economies (Samson, 2015). This is the case of waste recycling. Here, discards, informally collected and treated, become the inputs for new rounds of commodity production (Crang et al., 2013; Wong, 2015), which eventually enter the formal economy as raw materials, ready-made commodities and the like (Harris-White and Rodrigo, 2015; Samson, 2015). Indeed, the informal economy contributes to the overall economy and is often closely connected to formal activities (Chen, 2012; Meagher, 2013).

Moreover, Samson suggests that a central question in understanding the complex relation between accumulation by dispossession and the informal economy is the investigation of how the state and formal capital capture spheres of accumulation previously created in the informal economy (Samson, 2015). Building on the concept of 'epistemic injustice' by Miranda Fricker (2007), the author shows that informal recyclers at the Marie Louise landfill, where research was conducted, were subjected to a twofold process of dispossession (Samson, 2015). They were not only robbed of material resources, but were also erased in their role of epistemic agents. While informal recyclers created the knowledge that brought about a valuable redefinition of the landfill's social ontology, the state failed to recognise this fact and completely excluded them from the recycling process (Samson, 2015). Samson's (2015) work shows that accumulation by dispossession is a complex process that encompasses both semiotic and material dimensions. This is very powerful for two different reasons. Firstly, it points out that dispossession of material resources also entails epistemic injustice, erasing the positive role of informal actors in knowledge production. Secondly, it breaks with unidirectional narratives that describe the informal economy as an outcome of processes of

dispossession. By contrast, she demonstrates that the informal economy creates spheres of accumulation that are subjected to new processes of enclosure.

In accordance with Samson, I believe that it is theoretically productive to study dispossession from the perspective of the informal economy. I agree that accumulation by dispossession is a process that serves to colonise spaces of informality and to integrate them into different territories of market discipline (Soederberg, 2012). However, I also believe that this argument is not sufficient to move beyond the understanding of the divide between formal and informal activities, and eventually reinforces it (Inverardi-Ferri, 2016, forthcoming). By contrast, I suggest that both the linkages between formal and informal economies and the relationship between informality and dispossession are better understood if informed by studies on variegated capitalism (Peck and Theodore, 2007; Zhang and Peck, 2014). While literature has clearly suggested that informal economies represent immanent elements of the capitalist mode of production (Chen, 2012; Chen, 2012a), I believe that the understanding of how these activities relate to the heterogeneity of capitalism is still open to study. Therefore, in this chapter, I suggest that the multi-polar and multi-scalar approach of variegated capitalism (Hudson, 2011; Peck, 2013; Peck and Zhang, 2013) represents a potent tool to provide an initial contribution to fill this gap and to situate these processes in a broader picture. In my opinion, while the informal economy can be understood as an outcome of uneven development, it also represents a central characteristic of variegated modes of production and I believe that it is through the investigation of this dialectical relationship that it is possible to move beyond the dichotomy between formal and informal economies. From this perspective, I understand informality as a specific circuit of capital or a variety of capitalism that coproduces variegated economic formations. I therefore develop this line of reasoning in this chapter.

In doing so, I particularly engage with the concept of 'ecological dominance' (Jessop, 2014) and I contend that informal recycling in Beijing is affected by the uneven impact of alternative circuits of capital. Bob Jessop rightly points out that the market constitutes a 'self-organizing ecology of self-organizing economic spaces' (Jessop, 2014, p.5). He suggests that the uneven and combined development in the market integrates 'not only particular branches of capitalist production but also diverse pre- or non-capitalist forms of production and their respective social supports' (Jessop, 2014, p.5). This 'totality of production includes subsistence production, petty commodity production, household production, informal productive and reproductive labour and, *a fortiori*, their dynamic interrelations with capitalist production in all its variety' (Jessop, 2014, p.5). These different modes of production are integrated by and subjected to the process of ecological dominance. This notion refers here to the uneven impact that different circuits of capital and/or varieties of capitalism have on other elements of the market. In a given spatio-temporal framework some circuits of capital have the capacity to influence the development of other varieties of capitalism (Jessop, 2011). Jessop suggests that this process is not a mechanical one, but that the domination of a specific circuit of capital is the outcome of economic and political strategies that can involve the use of violence or the engineering of market rules (Jessop, 2014). For example, the ecological dominance of neo-liberalism in the world market reflects the political hegemony of global financial regimes together with the economic supremacy of global financial capital (Jessop, 2011).

The concept of ecological dominance is related to two other notions: *compossibility* and co-dependence (Jessop, 2014). Some varieties of capitalism can co-exist in the same economic space. Others cannot. Their *compossibility* reflects the positive, negative or neutral effects that the evolution of a specific variety has on other circuits of capital. Jessop suggests that this also involves the 'capacity of the state and political forces to use

soft power, force, and domination to impose specific patterns of valorisation, appropriation and dispossession' (Jessop, 2014, p.54), in other words, the capacity to impose a specific variety of capitalism. In this chapter, I suggest that informal recycling in Beijing is affected by the co-existence of different circuits of capital. I show that the evolution of informal recycling over the last three decades has been unevenly co-dependent on circuits of capital that characterise Chinese urbanisation. In other words, the urbanisation process of Beijing has consistently influenced the economic organisation of informal recycling. Here, it is necessary to note that while in the global north urbanisation is usually driven by what David Harvey calls secondary circuits of capital (Harvey, 1985), in developing countries urbanisation is often a state-led process which involves not only secondary but also, and mainly, primary circuits of capital (Lin and Yi, 2011). As clearly showed by Lin and Yi (2011), in China the production of the urban environment is strictly connected to both the political and economic imperatives of the state and thus represents a different logic compared with the rationale of informal recycling. Circuits of capital in the urbanisation and informal recycling represent different facets of the Chinese variegated mode of capitalism.

Finally, in this chapter I also outline how another force that has a strong impact on informal recycling is, unsurprisingly, the project of formalising the sector, that is to say the political and economic effort to promote the passage to a machinery and large-scale industry. Both the urbanisation process and the formalisation of the sector take the shape of a dispossession. In the first case recyclers are divorced from the land, in the second they are separated from the waste commons. However, the effect of these two enclosures is very different as I show in the following pages. This has important theoretical implications in showing the variegated nature of processes of dispossession

and in outlining the nexus between dispossession and informality. To further discuss this argument I now turn to my empirical study.

THE ENCLOSURE OF 'WASTE LAND'

At the beginning of the reform and opening up policies many men and women came to Beijing in search of a better life. They emigrated from neighbouring provinces. At the time, the construction industry was booming and the need for workers in metropolises was high. A massive army of rural migrants, usually referred to in the literature as the floating population[31] (Fan, 2011; Wang, 2013), offered the labour power required to sustain the urban transformation of metropolises. As described by Wang Laoban,

> 'back in those days, the entire country needed workers, they were recruiting workers everywhere. I had a relative who was working for a construction company, he told us that there were job opportunities and brought us with him to Beijing. We stayed in Chaoyangmen, where nowadays there is the Ministry of foreign affairs […]. [At the time], I used to work for a construction company. With my team we worked underground. Excavation. Physical work. Six Yuan per day.'

Wang Laoban addressed these words to Dongdong[32] and myself during one of our visits to Dongxiaokou. He welcomed us into his modest accommodation, composed of two small rooms and a big courtyard that he used to stockpile materials. A carbon stove provided warmth: the stovepipe traversed the entire room, as a way of maximising heat from the steam, before reaching the open-air outside the opposite wall. During the coldest months the temperature in Dongxiaokou could drop more than fifteen degrees below zero. To fight the winter, Wang Laoban, his wife and their child used to sleep

[31] The floating population merely follows 'capital, which has itself emigrated' (Marx, 1976, p.794).
[32] Tao Dongyan, my local research partner in Beijing.

together on the big bed that was serving, for our visit, as a sofa. Next to the bed, a computer screen was broadcasting images of the yard's entrance, in order to check who was approaching to the property. In the yard there were piles of valuable discards: old compressors, microwaves ovens, fire extinguishers, and principally all kinds of products containing copper. A fancy family car was parked just outside the courtyard on the dusty road that bisected the village. Wang Laoban was a relatively rich man, what you would call a 'small boss'. In the past, when the market was still booming, he used to hire two or three workers on a weekly basis to help him with his business.

Wang Laoban emigrated from the province of Henan in the eighties. He arrived in Beijing equipped only with his youth, hope, and courage. At the time, migrants were basically moving illegally because of the restriction connected with the *hukou* regulations. The household registration system was originally established in 1958 and aimed at controlling inner migrations[33]. While failing in preventing rural residents from moving into urban areas, the system succeeded, nonetheless, in unevenly dividing the labour market (Peck and Zhang, 2013). The hukou resulted, therefore, in a strong discriminatory measure for rural populations (Chan and Zhang, 1999), who offered themselves a cheap and unprotected force to boost the urbanisation process in metropolises. 'In the early years, before they controlled the Zhangzhuzhen[34] (暂住证)' says Lao Li, a fellow villager from Henan who was also involved in the trade of recyclables,

> 'we used to live together with many families. In the middle of the night, anybody could shout to give the alert [that the police was coming]. And then in a hurry everybody had to run away. People leaving alone, and others with wives. It was not convenient to have children. Sometimes,

[33] In December 2014 the State Council published a proposition for the reform of the hukou system in small and medium townships. However, substantial restrictions remain unchanged for megacities (cities with more than 5 million people). See State Council, [accessed 16 June 2015].
[34] The temporary resident permit.

> just the man used to run away. We used to lock the doors and leave wives and children inside, in silence. They shouldn't make a noise.'

Before the reform of the hukou and the normalisation of the process for obtaining a temporary resident's permit, which brought about a relatively increased inclusion of migrant workers into the urban society, migrant workers represented an extremely vulnerable population (Chan, 2015). Illegally working in Beijing, they were easily subjected to repressive measures when economic or political imperatives required implementation. Wang Laoban describes the harsh experiences that he underwent, particularly in the late eighties, when crackdowns became stronger as a consequence of the Tian'anmen events:

> 'in 1989, just after the rebellion (暴乱) for the first month the work was fine. Then, during the second month the tanks and the soldiers arrived. We were all very scared and we went down into the tunnels. Many people died.'

While contributing to the urban economy, in the impossibility of obtaining a local hukou, migrant workers experienced the denial of the most basic social services provided to the urban population (Chan and Buckingham, 2008). As described in the accounts above, they became, at best, second-class citizens or, at worst, a persecuted group relegated to a clandestine state (Zhang, 2001). In this harsh environment, common roots and social ties played a central function in initiating newcomers and supporting them all through their endeavours in the metropolis, as told by Wu Laoban, a small boss like Wang Laoban specialised in the trade of waste paper.

> 'In the eighties, the first and second waves of workers came to Beijing. At the time the telephone was not that common. It was like this in the poorer areas of the countryside. Communication was not that easy. Only once a year, during the spring festival we used to go back home and bring back the entire experience of one year. So, we pushed the next group of

> people to come to Beijing. We provided money, information, collaboration and every kind of help. This mechanism of evolution assured that an entire set of farmers entered the big city to work.'

The fragment above describes a so-called *guanxi* network (Yeung, 2004). As outlined in the previous chapter, this complex system of informal institutions supported the development and change of informal recycling over time. Since its beginning, this industry has therefore appeared as an economic activity socially embedded and institutionally mediated, which I have understood as a local sub-model of capitalism (Zhang and Peck, 2014). However, I have not considered this system as isolated, but as one coexisting and connected in different ways with state-led and formal private entrepreneurship. For instance, in the domain of real estate, private and state-led redevelopment projects have provided many business opportunities for recycling. In this regard, besides boosting local economies and national GDP (Hsing, 2010), a major consequence of the urbanisation process has been the explosion in the production of construction waste. Many of the people who first engaged in waste recycling were, therefore, migrant workers recruited by construction companies. Some of them quickly realised that it was possible to make a better living collecting at night what their employers told them to demolish during the day. 'At the very beginning' says an environmental activist who investigated the waste industry in China for several years,

> 'the big majority of migrant workers (农民工) were all employed on construction sites. They realised that the entire Beijing was demolishing and rebuilding. During the demolition, there were always discarded products. Maybe what was discarded in one place was needed somewhere else.'

In waste commerce, migrants coming from poorer rural regions and employed as construction workers in Beijing recognised a way to quit wage labour and to move to a more independent and remunerable activity, improving their economic and social status.

From this very beginning agglomeration economies also characterised the trade of discards. The first migrants who specialised in recycling gathered at the rural-urban fringe of Beijing. Here, they could rent cheap land and establish settlements for living and carrying out their activities. While this phenomenon occurred throughout the entire fringe of the metropolis, in this chapter I only focus on the fate of a group of recyclers that congregated in the northern periphery of Beijing. Originally, this group clustered around the area of Jianxiangqiao (健翔桥), almost six kilometres from the city centre, and through which the fourth ring road now runs and where the bridge of wohuqiao (卧虎桥) is located. At that time, as described by Lao Liu, the area was still a wasteland.

> 'When we first arrived, we used to live where now there is the north fouth ring road. At the beginning we lived at Jianxiangqiao, then we moved to several other places. At the time, it was extremely far from the city centre. There were no buildings, no people, and no cars. We collected waste. Cans, papers. Little by little we earned more money.'

Lao Liu was the son of a big market boss in Xiejia, a major hub for the refurbishment of electronics in the northern periphery of Beijing. In contrast to Wang Laoban, his family occupies a higher rank in the social stratification of waste recyclers, acting as a mediator between the migrant community and the local administration. Lao Liu's family, as many others, emigrated from Henan in the late eighties. They first lived in Jianxiangqiao, in the village of Erlizhuan. In the nineties this settlement was destroyed for the construction of the forth ring road and recyclers relocated further north. Some of them established their activities in Wali, other in Bajia. Literature usually refers to the latter location as the Henancun or the village of Henan (Béja et al., 1999) since the large majority of recyclers came from this region. In these settlements, says Lao Wang, the son of a big boss in Dongxiaokou,

> 'recyclers were mainly small investors. But a bit of scale had already appeared, mainly in Wali and Longwangtang. In the village, somebody had built a warehouse. There were maybe ten, twenty or thirty enterprises that gathered together.'

The relocation to Bajia and Wali contributed to the production of a new spatial organisation of the economic activity. In their work on the Henan village, Béja et al. (1999) describe this space through the notion of *desakota* (desa 'village' and kota 'urban', from Indonesian). This concept was first employed in studies on the urbanisation of Southeast Asian countries, where the metropolitan sprawl produced a high combination of rural and non-rural activities (McGee and Yaolin, 1992). Here, areas dedicated to the production of rice mixed with the urban landscapes (McGee and Yaolin, 1992). However, in a later work dedicated to China, McGee et al. (2007) moved beyond the notion of *desakota* and introduced the concept of Extended Metropolitan Region (EMR) to analyse specificities of Chinese urbanisation. Through the concept of EMR the authors contended that two different levels of urbanisation exist in contemporary China. The first one is an official level, inside the administrative boundaries of the city, and the second is an unofficial level, which goes beyond these boundaries and occurs at the margins of the metropolis or in the countryside (McGee et al., 2007). I believe that the production of space of waste markets is better understood through this reading. Moreover, the notion of EMR is useful to focus on different flows and uneven impacts of alternative circuits of capital. While waste recyclers crystallised their resources in the space of waste markets, official urbanisation fixed formal circuits of capital in urban redevelopment projects. This official production of space had a major impact on the economy of informal recyclers by recurrently dispossessing them of the land where both their activities and housing were established. Moreover, this phenomenon shaped the economic evolution of informal recycling over time, accelerating processes of

centralisation and concentration of capital in the migrant community, as I describe in the following paragraphs.

At the beginning of 2000s, the awarding of the 2008 Summer Olympic Games to Beijing resulted in a new wave of redevelopment projects. 'In 2001, Wali was destroyed because of the Olympic games' (Personal communication) and recyclers had to move once again. The project for the construction of the Olympic park and the redevelopment of neighbouring areas brought about the demolition of neighbourhoods where recyclers carried out their activities. At the time, Lao Wang's father was still a petty merchant. He decided to seize this opportunity to climb social ladders. He borrowed money to invest in the establishment of a new market in the rural village of Dongxiaokou.

> 'In 2002 Beijing had just reached the third ring road. The fourth ring road didn't exist yet. Dongxiaokou is outside the fifth ring road and at the time it was still a rural village. During an entire day you could not see one single car. The village was very poor. […] All around was wasteland. The grass was one or two people tall. We used bulldozers to level the land. It took us three days.'

As described in the previous chapter, Lao Wang's father realised a number of infrastructural works to create the waste market and then rented out plots of land to fellow villagers who relocated their activities there. New social relations now tied Lao Wang's father to his fellow villagers and empowered him with more responsibilities. Besides the work for the material construction and maintenance of the market, he was now responsible for a number of administrative procedures. He acted as a mediator between local authorities and small recyclers. This involved, for instance, the sorting out of commerce licences as described in the following account.

> 'In the market, we care for licences. We have a general business licence released by the industry and commerce office for the whole market. Back in those days, it was very easy to obtain one. We also wanted all

> merchants in our market to have their own licence. So we help them to get a 'small licence' (小照). However, over the years some merchants left and newcomers came without one. In recent years, getting this kind of licence has become more and more difficult. Merchants who do not have one just rely on the general licence of the market. Licences are valid for 20 years, but can be renewed. At the time it was very easy, they just waited for you to go there and pay taxes. Special licences came later. For metals, for instance, you need a special licence. So we also applied and obtained one. Now you pray to get one of these. In the past, it was easier, and in the village they even looked forward to us coming.'

This new role played by Lao Wang's father increasingly differentiated him from both small bosses and informal wageworkers. While the two latter groups appropriated value as a direct product of their labour, Lao Wang's father mainly captured profits by subletting land. As a result, he increasingly appeared as a different kind of entrepreneur, one who quite resembled to a genuine capitalist. This metamorphosis originated new economic behaviours in the man. He started to differentiate and fragmentise his businesses. He reinvested some of his profits in different sectors through a small asset management company that he established with his son in order to valorise the capital of the family. The demolition of the village of Wali had provided Lao Wang's father the opportunity to improve his social condition. This process also resulted in a new economic organisation of the industry in Dongxiaokou. It is clear that both the metamorphosis of Lao Wang's father and the evolution of informal recycling were interrelated with the dynamics of urbanisation and with the ecological dominance of circuits of capital that drove this process. Urban redevelopment projects not only recurrently dispossessed recyclers of their means of production, but also shaped the evolution of their economic activities over the years, accelerating the concentration and centralisation of capital in the community. In other words, urbanisation worked as a process of creative destruction (Harvey, 2008; Schumpeter, [1942] 2010). Here, it is worth to note that while the respective weight and impact of urbanisation and informal recycling was different, these two circuits of capital were interrelated, *compossible*, and

plausibly complementary (Jessop, 2014). By contrast, in the following part, I will show how the impact of other circuits of capital, and the political and economic projects associated with them, appears in antagonistic terms with the informal commerce of recyclables.

Figure 1. Demolitions in Dongxiaokou



THE ENCLOSURE OF THE 'WASTE COMMONS'

Between 2003 and 2008, informal recycling in Beijing experienced its golden age. This period corresponded to large investments in the domain of real estate and infrastructures for the preparation of the Olympic games. As the need for raw material increased sharply, the growth of redevelopment projects in Beijing boosted the recycling sector (Tao et al., 2014). Recycling markets in Dongxiaokou greatly benefited from this trend. New waste markets appeared overnight across the city. Benefiting from a number of competitive advantages, Dongxiaokou grew in scale and quickly occupied around two

thirds of the total trade of recyclables in Beijing (Tao et al., 2014). Here, almost every kind of recyclable such as wood, paper, plastics, waste garments, electronic appliances and the like could be traded. While some products were partially processed in the market, others were simply stocked and sold to middlemen or manufacturing companies outside Beijing. However, the expansion of the market suddenly came to a halt in 2008 when the Olympic games started. As described in the following account.

> 'In 2008 it was a big mess. Because of the Olympic games, trucks from outside Beijing could not come into the city. The price of the metals rose little by little. Copper was at more than 74 Yuan per kilo. We were also afraid of sending our trucks out, because controls were severe. Everybody was stockpiling materials. Around mid September, the interdiction ended, just after the Olympic games. Suddenly the price of metals dropped by two thirds. At the beginning copper cables were sold at 74 Yuan per kilogram, in one day they dropped to 68, then 64 Yuan. In less than one week they went down to 30 Yuan […]. I lost more than 100 000 Yuan, I was involved in little businesses at the time. Some people lost more. Millions. They lost everything. People who borrowed money from relatives suddenly had to give back millions.'

As outlined in the previous chapter, the fall in prices of raw materials was not only caused by local dynamics but was also increasingly intensified by the 2008 financial economic crisis. The general stagnation of the Chinese economy sharply reduced the demand for raw materials and prices collapsed. This contributed to worsen the crisis in Dongxiakou and caused, more generally, a severe blow to the recycling industry in China (Lora-Wainwright, 2017). A journalist from the Time magazine went to Beijing to record this fact and gave an unexpected international popularity to the 'scrap heap' of Dongxiaokou (Ramzy, 2008). Interestingly enough, the housing bubble in Florida produced an entanglement effect on the informal economy in China. The fate of Chinese recyclers was suddenly connected to the dynamics of global capital.

Indeed, local economies are not isolated in a void space, but engrained in a complex world market (Jessop, 2011). As globalisation contributes to overcome barriers of entry and accelerates capital mobility, the world market has become more integrated in recent years (Jessop, 2011). This is not to say that differences in time and space have become irrelevant, rather the opposite. The interaction of different economies is a complex phenomenon that cannot be reduced to a zero-sum game. As pointed out by Jessop, in the ecology of economic systems, some systems appear to be 'more equal than others' (Jessop, 2014, p.54). In this regard, the overwhelming effect of the financial crises shows how the impact of different circuits of capital can have far-reaching consequences, even reaching a scrap market in the suburbs of Beijing. However, this dynamic did not materialise in Dongxiaokou only because of the exterior economic threat produced by global circuits of capital but also because of a domestic political process. This took the shape of a state-led environmental plan.

As pointed out by Lora-Wainwright (2016), in past decades informal recycling has been tolerated and eventually endorsed by official authorities as an engine to promote local growth. In recent years, however, narratives portraying the informal economy as a source of uncontrolled environmental pollution have increasingly influenced policies in developing countries (Baldé et al., 2015). Under this agenda, since the beginning of the 2000s a number of central and local policies have been implemented in China. These efforts have principally focused on three different domains aimed at building municipal collection systems for recyclables (Wang et al., 2008; Zhang and Wen, 2014), introducing cutting edge technologies for the final disposal of solid waste (Li et al., 2015), and establishing management schemes for the recycling of specific waste streams, such as waste electrical and electronic appliances (e-waste) (CHEARI, 2015; Tong et al., 2015). In Beijing, a number of pilot projects for the establishment of a municipal collection

system for recyclables have been realised over the years (Wang et al., 2008; Zhang and Wen, 2014). Clearly, these efforts have been a direct source of competition for informal actors. Their effectiveness, however, has been often questioned. According to Chinese scholars, these projects did not achieve their goals, for they failed to integrate efficient informal networks into their systems (Chi et al., 2014; Zhang et al., 2010). As a result, today traditional actors still dominate the door-to-door collection (Linzner and Salhofer, 2014). As pointed out by a well-known Chinese scholar in the domain of waste management in a personal communication, this has occurred because informal recyclers are able to maximise value creation and enhancement.

Although they have achieved limited results, these projects have nevertheless been highly contested (Zhang and Wen, 2014). Likewise, the introduction of end-of-pipe technologies such as waste-to-energy plants has also been a debated topic (Johnson, 2013). In China, the number of incinerators has sharply increased in recent years. Fifty-seven new operating power plants have been built between 2011 and 2013 and these numbers are estimated to grow (Li et al., 2015). The practice of completely disposing waste, occupying small land areas and generating power, is a solution usually advocated as an efficient alternative for the final disposal of municipal solid waste (Li et al., 2015). Similarly, the recent implementation of the formal recycling scheme for e-waste (CHEARI, 2015), which I will analyse in more detail in chapter seven, appears to be rooted in analogous dynamics. Here, the institutional design of the scheme strongly supports big operators. The establishment of a formal certification system aiming at standardising and controlling recycling practices acts as a barrier to entry for small-scale operators, usually portrayed by official narratives as pursuing activities with high environmental costs (Schulz, 2015).

Unsurprisingly, the introduction of new technologies has far-reaching social and political consequences. Besides the growing concern for the uneven displacement of environmental and health externalities produced by large plants, capital-intensive facilities also represent a major threat to the livelihood of traditional recyclers (Gutberlet, 2012). As pointed out by Demaria and Schindler (2015) the development of large-scale industry in developing countries usually implies new value/waste chains that exclude small-scale actors. Clearly, the reconfiguration of urban metabolisms is a form of enclosure that dispossesses traditional recyclers who make a living through waste processing of their resources. While it is difficult to assess the factual scope of this process, due to the underground nature of informal activities and the lack of reliable data on this industry, it is not difficult to understand that the introduction of large-scale industry is characterized by circuits of capital accumulation that appear as antagonistic to informal activities and therefore represent a major threat to this economy. Indeed, environmental policies implicitly involve social and political choices that promote specific circuits of waste, value, and capital.

The introduction in China of alternative technologies and new legislation for the management of waste has thus a strong negative impact on informal actors. While these dynamics have clearly important material consequences, they also occupy fundamental symbolic spaces. The redefinition of the environmental discourse and the stigmatisation of informal recycling is indeed a form of epistemic injustice (Samson, 2015). The exclusion of traditional actors from both material and semiotic dimensions erases their positive role in the production of knowledge and practices that underpin the redefinition of waste as a resource (Samson, 2015). As pointed out by one of my informants:

> 'the first to collect discards were migrant workers employed in construction companies. At the very beginning they all started in this way, with a bicycle or a tricycle. At the time, they collected plastics and non-ferrous metals. Some materials could be collected freely while others were still controlled under the planned economy.'

This fragment describes how migrant workers who *scalvage*[35] waste materials produce the knowledge that transformed the social ontology of waste into a valuable resource from which they are now separated. In this regard, the account also underlines the importance of the transition to different property regimes. At the beginning of the eighties some waste materials could be collected freely while others were still administered under planned economy. Similarly, in recent years the introduction of new waste management schemes plays the not too corollary function of defining different property regimes. Today, while some categories of waste appear as a commons (Cavé, 2015; Lane, 2011; Schlager and Ostrom, 1992) others do not. For instance, the certification system of the e-waste scheme legally entitle a limited number of companies to process different categories of discards (CHEARI, 2015), institutionalising the dominance of specific circuits of capital over others.

CONCLUSION

In this chapter I have engaged with recent debates on the nexus between primitive accumulation and the informal economy (Gillespie, 2016; Samson, 2015). Recent scholarship recognises the importance of linkages between formal and informal activities and suggests that informality is an inherent element of contemporary capitalism (Chen, 2012; Meagher, 2013). This opens challenging questions about the characteristics of this

[35] For a description of the concept see Kirby and Lora-Wainwright (2015).

relationship as well as on the nature of dispossession in the informal economy. Different understandings exist in the literature. While some scholars understand the informal economy as a non-capitalist element of the market (Sanyal, 2007), in this chapter I have rather drawn on the work by Melanie Samson (2015) who pointed out that this position implicitly reinforces narratives on the formal-informal divide. Furthermore, by drawing on her work I have suggested that it is theoretically productive to study dispossession from the perspective of the informal economy. I agree with Samson that formal and informal economies are linked and that accumulation by dispossession is often a mechanism of formal capital to colonise spaces of informality. However, I have also suggested that this argument is still not sufficient to move beyond the formal-informal divide impasse.

I have thus suggested that a better understanding of both the formal-informal relationship and the nexus between informality and dispossession can be informed by a reading of these phenomena through analytics on variegated capitalism (Peck and Theodore, 2007). In particular, building on the concept of ecological dominance (Jessop, 2014), I contended that dispossession in the informal economy can be analysed as the result of the uneven impact of alternative circuits of capital. From this standpoint, informality does not appear as the *other* of formal economy, but rather as one circuit of capital in a variegated mode of production conceived as an ecology of different economic systems. I have thus operated this argument through my empirical account focusing on the struggle of a community of informal recyclers in Beijing and showed that both the urbanisation process and the introduction of new technologies and regulations for waste management have a significant impact on informal recycling. Here, I have pointed out that urbanisation has recurrently dispossessed recyclers of land. However, while urban circuits of capital appear to be *compossible* (Jessop, 2014) with informal

recycling, this is not the case for capital fixed into waste management technologies. These circuits of capital represent a rival economic force, which appears unlikely to co-exist with traditional practices of recycling. Indeed, cutting edge technologies pave the way to a variety of capitalism highly based on machinery, large-scale industry and formal wage labour. This fact, I believe, has important theoretical implications in conceiving dispossession as a variegated process. In particular, it highlights a twofold character of the relationship between dispossession and informality. Although, in the first case, producers are recurrently separated from their means of production, this process is not necessarily connected with the path towards large-scale industry. Recyclers have periodically reorganised their activities in new locations, maintaining a hybrid form of economic organisation. As a result, while accelerating the evolution of the system, these circuits of capital appear to be *compossible* with informal economy. In a different manner, the definitive enclosure through legislation of the waste commons pave the way to new social relations of production. Somehow, this second metamorphosis has the original flavour of the historical process of primitive accumulation.

GEOGRAPHIES OF INVISIBILITY

LIVELIHOOD STRATEGIES, INFORMAL LABOUR, AND WORKER AGENCY

CHAPTER 6

Ora, se innanzi a me nulla s'aombra,
non ti maravigliar più che d'i cieli
che l'uno a l'altro raggio non ingombra.

A soffrir tormenti, caldi e geli
simili corpi la Virtù dispone
che, come fa, non vuol ch'a noi si sveli.

Do not wonder if I cast no shadow,
no more than that the heavenly spheres
do not cut off their rays from one another.

The power that fits bodies like ours
to suffer torments, heat, and cold
does not reveal the secret of its working[36].

Dante Alighieri, *Divine comedy*, Purgatorio, III.

INTRODUCTION

Over the last decades labour geography has become an influential sub-discipline in economic geography (Rutherford, 2010). In this chapter, I engage with this strand of literature and particularly with the concept of labour agency (Herod, 1997). Andrew Herod, who created the label at the end of the nineties, suggested that geography had attached surprisingly little attention to the role of '*workers* in making the economic geography of capitalism' (Herod, 1997, p.1) (emphasis in original). Except for the work of few Marxist scholars (Clark, 1988; Clark, 1986; Clark, 1989; Peet, 1983; Walker and Storper, 1981), both neoclassical and, paradoxically, Marxist geographers have contributed to make the agency of workers invisible, considering labour as a mere factor of production or as variable capital (Herod, 1997).

[36] Italian version in Dante, Alighieri (1991), English translation in Dante, Alighieri (2004).

Addressing this gap, Herod published an influential paper in 1997. This was nothing less than a call to arms to investigate how workers actively participate, consciously and unconsciously, in the shaping of the uneven geography of capitalism. Herod suggested that, although workers, waged and unwaged, organise themselves along political, social, racial, gender, and cultural lines, their belonging to the proletariat shapes geography in ways different from that of capital. Herod suggested that in order to highlight this particular production of spaces, which he called, inspired by Harvey (2005), 'spatial fixes of labour', the investigation of worker agency was of central importance. Studying agency, for him, meant to focus on labour inside and outside the domain of production. This paradigm shift encouraged research on the strategies of self-reproduction and social survival of the working class. As pointed out by the author, while capital shapes the economic space in ways that facilitates its reproduction, so does labour (Herod, 1997). From this perspective, the understanding of processes and strategies of workers' social reproduction contributes to a deeper understanding of the uneven and variegated geography of contemporary capitalism, and could eventually help the dispossessed and the oppressed. Since the publication of Herod's paper in 1997, the field has grown, both theoretically and empirically, with several critical reviews of the literature being published (Coe, 2013). As pointed out by Coe and Jordhus-Lier (2011), four distinct strands can be discerned in this scholarship. These have mainly been concerned with collective organisation, local labour regimes, workplace identity, and material landscapes. While the common focus in these studies has been the investigation of worker agency, this notion had been surprisingly under-theorised and under-specified in the scholarship for long time (Castree, 2007).

Coe and Jordhus-Lier (2011) have made a dramatic contribution to reconceptualise labour agency and to develop it in relation to different temporalities and geographies.

They suggested that labour agency is dialectically related to social structures and embedded in four different arenas: capital, the state, the community and the labour market. To support their arguments the authors discuss the relationship between agency and structure, a well-debated topic in human geography since the eighties[37]. Here it is sufficient to say that they do not refer to the exchanges with the field of poststructuralism and postmodernism, but they rather focus on the 'structurationist school' (Giddens, 1984) and its major critics (Jessop, 2001). To summarise, Coe and Jordhus-Lier (2011) dismiss both positions as too abstract, and suggest that the understanding of the activity of agents with particular interests needs to be combined with the recognition that processes are constrained by uneven power relations. In other words, they pointed out that labour agency is always embedded in 'social relations that condition [its] potential' (Coe and Jordhus-Lier, 2011, p.216). In their opinion, this perspective gives more justice to the chaos of the real world.

Furthermore, they suggest, in accordance with Cumbers et al. (2010), that a productive way to understand labour agency is through the lenses of Katz's (2004) work. Katz disaggregates the Gramscian concept of independent initiative[38] of subaltern groups (Gramsci, 2007; Gramsci, 1934; Zene, 2013) into the categories of *resilience*, *reworking* and *resistance*. Resilience refers to small daily acts of getting by, which alter relations of production. Reworking refers to the effort of recalibrating uneven power relationships and of undermining the structural constraints of everyday life. Resistance refers to the conscious intention of confronting and subverting conditions of oppression and exploitation (Katz, 2004). Coe and Jordhus-Lier embrace Katz's notions in order to highlight different levels and scales of action as well as to distinguish between individual

[37] For further discussion on this point see Coe, Neil M. and David C. Jordhus-Lier (2011), Rutherford, Tod (2010), and Gregson, Nicky (2005).
[38] In Italian *iniziativa autonoma* (autonomous initiative).

and collective agency. In other words, their effort is to escape narrow definitions of agents and structures, and to provide a framework that could explain labour agency as 'spatially and temporary *variegated*' (Coe and Jordhus-Lier, 2001, p. 218) (emphasis in original).

Pushing forward these arguments, Carswell and De Neve (2013) proposed, building on Neilson and Pritchard (2010), to analyse agency both vertically and horizontally. They pointed out that labour agency is not only embedded in vertical structures, such as global production networks (Coe and Hess, 2013), which confine its possibilities, but is also linked to horizontal social relations, such as gender, age and cast, which are in turn elements of regional economies and cultural environments. In their opinion, labour geography has so far favoured the investigation of collective over individual action as well as acts of resistance over a broader range of workers' practices. In particular, they pointed out that research has paid little attention to livelihood strategies, everyday individual acts, and informal practices through which workers construct their lives (Carswell and De Neve, 2013). This can be seen for instance in the invisible struggle of international migrants, the everyday hardship of farmers, and the informal practices of other groups of workers who seek to improve their material means in different ways. The authors suggest that a serious reengagement is necessary within the sphere of reproduction and its relationship with production. In the specific context of China, the work of Tamara Jacka (2006) is an important contribution that advances both empirically and theoretically this perspective. In her work *Rural Women in Urban China*, the author shows how migrants, consciously and unconsciously, define their agency as the capacity of enduring hardship (Jacka, 2006). Following this line of argument, I suggest that a productive domain of enquiry to foster our understanding of labour agency is the analysis of informal workers, waged and non-waged, and their livelihood strategies in the

waste industry. While the relations between the sphere of reproduction and production has long been a debated topic in feminist labour geography (Teeple Hopkins, 2015), not many studies in labour geography have, to my knowledge, articulated the concept of labour agency within the informal economy (Carswell and De Neve, 2013; De Neve, 2014; Furniss, 2015; Harris-White and Rodrigo, 2015; Jacka, 2006; Thieme, 2010).

Here, it is important to state that defining informality is not an easy task. As Schindler (2013) correctly points out, formality and informality are not ontological given categories, rather their boundaries are contested and produced over the course of struggles of different empowered actors in a variety of ways such as jurisdiction as well as everyday practices of enforcement and subversion. Moreover, research has suggested that informality is strictly linked and contributes to the overall economy in different ways (Meagher, 2013). Samson (2015) suggests that workers purposely create linkages between formal and informal spheres of the economy, strategically moving between these activities in order to improve their material lives. Along the same lines, De Neve (2014) shows that workers in the Tiruppur garment industry intentionally decide to transfer into more flexible and informal firms in search of a decent livelihood, critiquing and actively seeking to evade the environment and regulations of formal enterprises that limit their freedom, autonomy and dignity.

Wage-labour and oppressive practices, such as unprotected and forced labour, also exist in what it is usually labelled as the informal economy. However, practices of informality often represent conscious strategies to drop out of uneven power relationships, to enable workers to enter into reciprocal exchanges, and to actively rework and resist oppressive circumstances dictated by capital. Therefore, I believe that the study of the informal economy is particularly productive in investigating the question of 'how workers

themselves actively seek to shape the economic geography of capitalism and to make space in ways not dictated by capital' (Herod, 1997, p.13).

For these reasons, in the following pages, I focus on different stories of migrant workers in China. Some of them appear as trajectories of small entrepreneurs or 'petty capitalists' (Gates, 1996; Marx, [1867] 1976; Zhang, 2001). It could appear as surprising to investigate labour agency through these stories. Here, it is necessary to highlight that I understand that 'capital is not a thing, but a social relation between persons which is mediated through things' (Marx, 1976, p.932) and that a human being, only under certain social relations, i.e. capitalist social relations, becomes a wage-labour and confronts the capitalist in the labour market (Marx, 1976). However, I contend that this does not imply that the wage-worker is the only locus of labour agency. Agency is not crystallised either in things or in humans, rather I believe it is a process that operates on different scales and temporalities (Coe, 2013). As a result, its effects can be traced back and revealed through the practices and strategies of people that struggle to remain outside capitalist social relations, exploiting weak spots in the system (Coe and Hess, 2013).

In this chapter I therefore give account of the everyday practices of waste *scalvagers*[39] in Beijing, a group mainly composed of migrants from rural regions. I suggest that their actions are inspired by the aim to regain control over their labour time in the spheres of production and reproduction. As a result, while struggling to improve their material lives, these people mould the physical and economic space in ways that facilitate their own self-reproduction, creating new spatial fixes (Harvey, 2005; Herod, 1997). While I suggest that they adopt a variety of strategies, which in some cases radically change the rules of

[39] See Kirby and Lora-Wainwright (2015).

the game, I also contend that a common characteristic of this variegated agency is its invisibility, a concept that I unpack in the following section.

GEOGRAPHIES OF INVISIBILITY

The main characters in the story of Beijing recycling are individual collectors, small workshop artisans, family-owned firm entrepreneurs, and local shop owners. As I have argued in previous chapter, this is a phenomenon deeply embedded in a sub-cultural context that shapes the identity of a migrant community, sharing the same language, culture, origins, and values of hard-work and modesty. Furthermore, I contend that the central quality that defines the agency of informal workers is *invisibility*. As I describe in the following pages, this refers to a number of diverse features that encompass the absolute, relative, and relational dimensions of space (Harvey, 2006; Lefebvre, [1974] 1991). Indeed, invisibility is a metaphor used to anticipate a number of central hypotheses (Dematteis, 1985). As described by Dematteis:

> 'In fine arts [metaphors] are used to communicate what cannot be made explicit in logical and rational language. In geography, however, metaphors have the opposite function: that of anticipating hypotheses, concepts and theoretical perspectives […], precisely because the metaphor defines a research project of sorts, the result of which is indeed the translation of this very metaphor into rational language. (Dematteis, 2010)' (Fall and Minca, 2013, p.552).

Surprising as it may seem, while the metaphor of invisibility has largely been used in different strands of geographical literature, to my knowledge a comprehensive review of this concept has not yet been realised. Indeed, the investigation of the different domains, dimensions and meanings of invisibility by the scrutinising its positive and negative

definitions in the literature would probably be an exciting project *per se*. This work would result in mapping the territories of a *geography of invisibility*, and definitively implying to scrutinise this concept in other disciplines[40]. This would stray too far from the aims of this thesis however, so it is therefore not the goal of this chapter: I leave this task for a future project. Here, I prefer to only highlight the main dimensions of invisibility that I use to inform my account and develop my analysis vis-à-vis the questions treated in this research. However, before outlining the literature that informs my research, it is worth briefly acknowledging other studies in geography that are associated with the notion of invisibility, but with which I do not directly engage.

Two terms appear to delimit the opposite poles of speculation around invisibility in the scholarship: ghosts and materials. Indeed, the notion of invisibility can be associated with recent scholarship, building on the work of Derrida ([1993] 2012), in spectral geography (Buse and Stott, 1999; Maddern and Adey, 2008; Matless, 2008; Wylie, 2007). Here, ghosts become a metaphor to study the intellect and what is excluded by it (Buse and Stott, 1999). Ghosts are 'in-between visibility and invisibility, and between observer and observed' (Wylie, 2007, p.172). They serve to challenge linear notions of history and geography (Maddern and Adey, 2008). Moving from the world of ghosts to the world of matter, literature in science and technology studies (Bennett, 2010; Braun and Whatmore, 2010; Gabrys, 2011; Gabrys et al., 2013) has also examined the concept of invisibility in its research project (Barry, 2013; Barry, 2009). In *Material Politics*, Andrew Barry operates this concept to bring to light conflicts around the construction of a pipeline in the Middle East (Barry, 2013), contending that the interplay between visibility and invisibility hold a central place in the disputes he analyses. The author suggests that the physical

[40] See for instance the important contribution of philosophy, Merleau-Ponty, Maurice (1968).

invisibility of the underground pipeline mirrors the increasing visible information produced through formal procedures of accountability and transparency. He thus shows how conflicts tend to revolve around 'material objects and processes that are entangled in ever-growing quantities of information' (Barry, 2013, p.2).

These works are useful sources of insight into the symbolic, semiotic, and material dimensions of invisibility. When, where and under which conditions does economic activity become invisible, and for whom and with what consequences? This research definitively resonates with a number of issues in my project. However, to interrogate the concept of invisibility I principally draw on studies in labour geography, particularly from the strand focusing on gender and race issues (Jacka, 2006; McDowell, 2009; McDowell, 2013; Teeple Hopkins, 2015) which share objectives closer to my research project. Indeed, through this perspective invisibility can be conceived as a socio-political process that brings about an uneven access to resources and labour for subaltern groups[41].

The gender perspective is indeed particularly productive in investigating invisibility, a concept that more generally finds fertile ground in feminist theory (Butler, [1990] 2014; Butler, 1988; Butler, 1986; De Beauvoir, 1949). Women and gender scholars have investigated both theoretical and empirical issues of marginalisation and discrimination (Longhurst, 2002) aiming to 'bring female specificity into visibility and to rewrite the history of culture in terms which acknowledge the presence, the influence and the oppression of women' (Butler, 1988, p.523). In fact, although economic, ethnic and cultural characteristics embodied by different social groups become elements of

[41] Outside the perimeter of geography a number of authors, such as Adams, Cristina et al. (2009), Coloma, Roland Sintos, Bonnie McElhinny, and Ethel Tungohan (2012) and Gross, Larry P. (2001), have also understood the concept of invisibility in these terms.

oppression at specific latitudes, gender has the peculiarity of traversing geographical divides as clearly pointed out by Gayatri Spivak ([1988] 1994, p.90):

> 'Can the subaltern speak? What must the elite do to watch out for the continuing construction of the subaltern? The question of "woman" seems most problematic in this context. Clearly, if you are poor, black and female you get it in three ways. If, however, this formulation is moved from the first-world context into the postcolonial (which is not identical with the third-world) context, the description of "black" or "of color" loses persuasive significance.'

In other words, sexism represents the lowest common denominator of social discrimination. Unsurprisingly, the work of scholars focusing on gender issues has been extremely powerful in articulating the concept of invisibility (Fedyuk, 2006; hooks, 1981; Sesko and Biernat, 2010). Focusing on female skilled migrants, Eleonore Kofman points out how restrictive immigration policies become a dispositive for denying autonomy and choice to migrant women (Kofman, 2000; Kofman et al., 2000).

In *Working Bodies* Linda McDowell operates this concept with ideas of race, class and gender. According to the British scholar, while domestic work is 'by definition unseen and invisible' (McDowell, 2009, p.83), other tasks in wage-labour require different degrees of invisibility and as such, specific jobs and occupations are more or less 'gendered' (McDowell, 2009, p.52). Invisible services of cleaning are thus opposed with visible services 'with a smile' (McDowell, 2009, p.201), i.e. receptionist jobs, which are often sexualised and highly rewarded. Invisibility is thus defined as the quality of 'servicing without being noticed' (McDowell, 2009, p.192).

Similarly in *Working lives*, McDowell (2013) examines the relations between immigration, employment and gender, challenging conventional assumptions about division of labour

in post-war Britain. The author looks at histories and memoirs showing how migrant women not only undertook domestic tasks, but also waged employment. Invisibility thus becomes a metaphor for the unseen labour of women as workers in their own right. However, in McDowell's research invisibility is not only a mark of stigmatisation but also a complex phenomenon that affects migrants beyond the gender divide. The author shows how for some groups, such as migrants from East-Central Europe, invisibility became a conscious strategy to reach specific goals of integration and social climbing.

I build on these multiple definitions of invisibility in labour geography and gender studies to define invisibility as I use it in my research. However, I contend that, to be used as a productive device, invisibility in geography needs to be understood as in dialectical relation with the concept of space, which as outlined by Harvey (Harvey, [1973] 2009; Harvey, 2006) exists in its tripartite nature of absolute, relative, and relational dimensions. I thus delimit these same three complementary dimensions for invisibility, which are in dialectical relationship with each other and positively construct the concept. These are the absolute, the relative and the relational spatialities of invisibility (Harvey, 2006; Lefebvre, [1974] 1991).

The absolute dimension refers to the physical space. The absolute space is the 'thing itself', the pigeonhole where phenomena occur (Harvey, 2006). This dimension of invisibility refers, therefore, to the presence or absence of specific spaces of livelihood, consumption, production, and reproduction. For instance, the invisibility of these specific places rests in the recurrent shocks that the physical infrastructure undergoes through their demolition and relocation in more remote areas of the city, exacerbating the mechanisms of uneven redistribution of real incomes for the poorest groups (Harvey, [1973] 2009). The specific case analysed in this work concerns the space of

informal settlements and markets. As outlined by Tamara Jacka (2006) in her study on rural migrant women in urban China, invisibility is a powerful metaphor for outlining the marginality of migrant settlements in China as well as the status of their populations.

The relative dimension refers to space, and thus to its invisibility, as the connection between objects that relate to each other (Harvey, 2009; Harvey 2006). In other words, it refers to the circulation of flows of value (and waste), people, and knowledge. Here, invisibility is conceived as a phenomenon that hides different spaces and specific accumulation regimes associated with them. For instance, invisibility can be understood as a conscious strategy aimed at improving workers' material lives. While focusing on the everyday practices of workers and their representations, specific production regimes and different mechanisms of value creation and capture become more or less visible.

Finally, the relational dimension refers to space conceived as being contained in objects (Harvey, 2009; Harvey 2006). 'Processes do not occur *in* space but define their own spatial frame' (emphasis in original) (Harvey, 2006, p.123). This implies that objects, space, and processes do not exist independently from the internal relations and external influences that are internalised in them over time (Harvey, 2006). Therefore this dimension focuses on space by analysing the sociopolitical processes that define it. As a result, space does not exist only as an absolute measurable object defined by its physical boundaries, or as a relative thing defined by the flows of value (and waste) that circulate through it, but also as an abstract reality constructed by alternative narratives, collective memories, and contrasting representations. Invisibility, here, directly interrogates social phenomena such as stigmatisation and marginalisation of subaltern groups, and serves to understand the variable capacity of different empowered groups to impose discourses on space and to make specific social phenomena more or less visible. For instance, in my

work this dimension focuses on the internal and external social relations of the community of waste recyclers conceived as a subcultural group, within a determined society.

Furthermore, I contend that invisibility is in a dialectical relationship with labour agency. It is both a socioeconomic process that brings about an uneven access to resources and labour to subaltern groups and a relational concept that allows scrutiny of the physical, economic, and socio-political spaces where labour agency unfolds. A curse and an asset, invisibility constrains and fosters labour agency. On the one hand, invisibility describes a conscious strategy that subaltern groups operate to promote objectives of integration and social climbing. On the other hand, it refers to the physical and social marginalisation of informal activities, which rarely receive the support of official powers. Invisibility can thus be mobilised to highlight how, in China, official authorities often have an ambivalent attitude towards informal activities (Goldstein, 2006; Lora-Wainwright, 2016). As pointed out by a Chinese informant in a personal communication, while they tolerate informal recycling, authorities would prefer to substitute it with more 'modern' technologies, which often implies a transition to machinery and large-scale industry:

> 'They'd prefer not to take care of us. This doesn't mean that they don't hope that you do it right. However, they'd prefer, for safety, that we stop doing this activity, and they use relatively simple and rude methods to drive us out.'

Here, 'rude methods' refers to the forced demolition and relocation of 'waste markets', informal settlements where recycling activities are carried out, as described in the previous chapter. In this regard, the notion of invisibility is a tool to analyse the changes in the environment that affect the development of informal recycling in China. Over the last thirty years, policies of redevelopment have brought about recurrent demolitions and

relocations of waste markets. As I have shown in the previous chapter, recyclers working and living in Beijing have become a nomadic population repeatedly dispossessed of their means of production. While waste markets have been periodically demolished, they have nevertheless always reappeared in more remote areas of the metropolis giving proof of both the impermanence and resilience of this industry. Recent works suggest that in China today, the informal economy is double the number of the formally employed urban working force (Huang, 2009), and between five (Linzner and Salhofer, 2014; Zhang and Wen, 2014) to twenty million workers (Wang et al., 2013) are involved in informal recycling, collecting and treating waste products. However, a simplistic *laissez-faire* perspective masks the uneven power relations, inner struggles, and contradictions that also exist in informal recycling. In this regard, invisibility also refers to the inner mechanisms of this industry and is a metaphor used to highlight the condition of the weakest groups of this system. Therefore, the notion of invisibility not only refers to the social group of migrant workers as a whole, but also to the condition of the lowest classes within it. In order to further unpack this concept, in the following sections I describe and analyse the everyday practices and survival strategies of informal workers in Beijing to show how individual and collective choices, aimed at improving material existence, often result in small acts of resilience to, reworking of, and resistance towards capitalist dynamics of exploitation and oppression.

LAO ZHANG OR THE INVISIBLE MAN

I used to take the subway up to Xixiaokou in the northern suburbs of Beijing and then walk west for almost two kilometres on a dusty local road to reach the southeast entrance of the urban village. This was the usual way. However, that day Lao Zhang expressly

asked me to get off at the subway station of Yuxinzhang. I arrived at around eleven. Lao Zhang was waiting outside the station, opposite a board with flashing Chinese characters that read 'Patriotism, Innovation, Tolerance, Generosity'. He greeted me with a generous smile and asked to get on the back seat of his scooter. The scooter was small and it had several bags hanging from both sides. He turned on the engine and started to ride in the direction of the village. It was a gold morning in September and the sky was unusually blue.

At the time of my fieldwork, Lao Zhang was 44 years old. He was what should be called a migrant worker (Franceschini, 2014; Wong et al., 2007; Xiang, 2005; Xiang, 2000; Zhang, 2001). He had married his wife at the age of 23. His first child was born two years later. For the second born the family had to pay a fine. Lao Zhang had come to Beijing alone as a young man from the province of Shangdong in the early nineties. He used to go back to visit his family every two to three months. He had done this for more than twenty years. Indeed, his sacrifices in Beijing could guarantee a good life for his wife and children in their hometown. Moreover, the savings were enough to build a new house, little by little.

Lao Zhang had been a construction worker for almost two decades. 'The pay was good', he told me, 'but the job was exhausting'. So, a few years before we met, he decided to drop out of this industry. Instead, he started to collect old mobile phones and other waste products. While this choice was motivated by the goal of improving his material existence, in other words belonging to the sphere of social reproduction, the implications of his action were more far reaching, as I show in the following pages.

After few minutes travelling east, Lao Zhang took a right turn. We rode along the fence of a state-owned company and continued south for a while. As we moved further, high buildings became more rare and the road turned into a country path. Both sides of the path were now decorated with a mix of grass and discards, mainly yellow foam from dismantled refrigerators, scrap metal, and the like. A dog sitting in the middle of this hybrid environment watched us as we passed by. We had entered Dongxiaokou.

As I described in previous chapters, Dongxiaokou had for many years been the largest market for waste products in Beijing. Between September 2013 and December 2014, when I carried out my fieldwork, only few parts of it were still operational. Many businesses had closed or relocated to other parts of the metropolis due to the pressure of urban redevelopment projects in the area, which had resulted in waves of evictions and expropriations.

Lao Zhang stopped the scooter in front of a white building, which stood solidly between the small shaggy houses. I got off the vehicle and followed him into the building. Lao Zhang was sitting on his scooter, showing the way. We entered a room with a desk covered by layers of dust, a couple of dismantled washing machines and a big sofa. A strong smell of mould filled the space. I kept following Lao Zhang through a narrow corridor, into a bigger room. The man parked his scooter and turned the engine off. It was dark. There were no windows in the room and the only light came from a lamp, which had temporarily blinded me, hanging on the wall opposite the entrance. My eyes slowly got used to the new environment and I started to take in my surroundings. There were at least 20 beds, one next to the other. They were all empty except for one attached to the right-side wall, where a man was sleeping. The building had other rooms like that one. Similar places were in fact quite common in Dongxiaokou as well as in other urban

villages in peripheral areas of Beijing. They were usually called *da yuan* (大院), big housing compounds.

Figure 1. The *da yuan* and the scooter of Lao Zhang





The first big housing compound of this kind appeared in Beijing in the early nineties, as suggested by Zhang Li in her work on the Zhejiang village (Zhang, 2001). This was originally managed by the local committee of Dongluiyaun, a village in the southern area of Beijing municipality. Here, the committee had built few rows of houses on a small plot of land to shelter the migrant population that was arriving from other regions. Later the committee built walls and a gate around the area. In this manner, the first *da yuan* appeared in the capital. As migrants poured into metropolises, villages at the rural-urban fridge started to profit from renting out rooms (Hsing, 2010). In the following years, as the demand for housing grew, wealthier migrants already established in Beijing turned to the construction of these compounds. A new business as well as a new figure of migrant leader, the *da yuan laoban* (the compound boss) was born (Zhang, 2001). Over the years, the spatial structure of these compounds has diversified, however, the main rationale behind their construction has remained the same: providing cheap housing to migrants.

Once in the room, Lao Zhang opened the small leather bag attached to his belt, where he used to keep his most precious belongings. He took some money out of it and put it in one of his pockets. It was a pack of red bills, most probably his entire monthly earnings. He put his mobile phone in another pocket and he finally threw the rest of the contents of the bag on to a bed. Lao Zhang was never fixed in one place, and he used to constantly move to different neighbourhoods of the metropolis looking for the commodities he traded, as in a modern gold rush (Cavé, 2015). He was a 'nomad' (Béja et al., 1999, p.51). At night he used to sleep in Dongxiaokou or, if his wanderings had pushed him into a different part of the city, in other informal settlements at the edge of Beijing. A bed was rarely more expensive than ten yuan per night. He told me,

> 'you can always find a place to sleep, though sometimes it is a bit more expensive. All the people living in this room are from my village. They are almost all called Yang (姓杨), my family name.'

Indeed, social networks were important in the life of Lao Zhang. As described by Zhang (2001), traditional networks did not obstruct the development of market economy in China, but rather these elements became the very basis on which the economic structure has taken form. Zhang explains that rural migrants usually adopted two main mechanisms to foster economic activities: place (*diyuan*) and blood (*xueyuan*) relationships (Zhang, 2001). The idea of being born in the same family or place creates particular bonds between people and mediates the relationship to labour. As I argued in the previous chapter, this sociocultural embeddedness of economic activities has given rise to heterogeneous formations that are a productive field for the investigation of the variegated nature of capitalism in contemporary China (Peck and Theodore, 2007; Peck and Zhang, 2013; Yeung, 2004; Zhang and Peck, 2014). Pushing forward this argument I suggest that informal economies are also the site where different expressions of labour

agency can be examined. Workers consciously choose to turn to informality for making a better living and in doing so are able to rework and resist oppressive social relations of production, as clearly shown in the following quote.

> 'Here, we do not have a boss. We are all self-entrepreneurs (个体的). I am my own boss (我是老板). We live together. At evening we eat together. During the day we all go our own way. Then, we come back here. We live together, because in this way it's a bit better. We play cards, *doudizhu*[42]. You need 3 people to play. We bet. Like in poker. Now, the others have already left. I waited for you one more day. They went back home, for the harvest. Here, everybody does the same job. We buy together and we sell together. Everybody gets their profits. (利润是个人的). The things I buy are mine; yours are yours. Do you understand? We get in contact with the buyers and then we sell them the entire lot. The buyers are from Hebei, Chengde.'

As the quote above suggests, the choice to leave the employment as a construction worker and enter into the business of waste recycling made of Lao Zhang a self-styled 'boss'. Interestingly, this metamorphosis into an *entrepreneur de lui-même* (entrepreneur of oneself) (Foucault, 2004) gave him the possibility to enter into reciprocal exchanges with his fellow villagers and escape relationships that he considered more oppressive. As I describe in previous chapters, small collectors like Lao Zhang usually resell their commodities to middlemen in Beijing, who in turn resell these products to other intermediaries outside the capital or directly to manufacturing companies and dismantling workshops. Instead, as described in the account above, the coordination between Lao Zhang and other waste collectors enabled this group of migrants to directly resell their commodities to external buyers and obtain, therefore, more value from their work.

[42] *Fight the landlord* (斗地主), one of the most popular Chinese card games.

As explained by Bezuidenhout and Buhlungu, 'worker agency can be informal or formal, individual or collective, spontaneous or goal directed, sporadic or sustained, and it can operate on different scales. It can unite and compound, and yet it can also fracture and fragment' (Bezuidenhout and Buhlungu, 2011, p.258). I suggest that in the trajectory of Lao Zhang, labour agency clearly appears in at least two distinct moments. First, it is present in the act of leaving the employment as a construction worker. Second, it manifests itself in the coordination with other members of the migrant community. Indeed, this heterogeneous set of livelihood and working strategies enabled Lao Zhang to exploit a weak spot in the value chain of waste recycling and contributed to the production of a brand-new spatial-fix. Here, I believe that it is interesting to note how this process is characterised by its invisibility. This refers both to the marginalised condition of Lao Zhang as well as to his conscious strategy to exploit this feature to his advantage.

Lao Zhang mainly collected three kinds of products: used mobile phones, hair, and watercolours. 'In life you never know where you can make money' (人人一生，说不清楚在哪财一下) he told me. However, while he traded both hair and mobile phones, he used to collect watercolours for his personal pleasure. This fact, which revealed a gentle trait of the personality of Lao Zhang, made me feel instant empathy for the man. Lao Zhang explained to me that the price of mobile phones varied according to the model as well as to their condition. An old broken phone was not worth many yuan, but a functioning model from a good brand could reach several hundred. The mobile phones that could not be repaired were sold per ton (顿), the others received a 'face-lift' (翻新).

Lao Zhang had a small device attached to his scooter. It was a speaker programmed with the recording of a woman's voice. He used to turn it on when looking for his

commodities so people knew of his arrival and came out of their apartments with their discards. Only women, said Lao Zhang, sold hair. This served to make wigs and similar products. Every month, Lao Zhang earned around five thousand yuan. The best months could reach twenty thousand, but this was quite rare. It was a skilled job, he told me, and somebody like me could not make half of his worst month's earnings.

Figure 2. Precious commodities in a recycler's life





We ate our lunch sitting on the edge of two beds, drinking a strong distilled spirit. As the alcohol entered our bodies, we discussed more personal topics. I asked Lao Zhang about his sexual life. Since prostitutes had diseases, he told me, the only way was to go back home. Lao Zhang invited the man who was sleeping on one of the beds to join us. While the man was slowly approaching, Lao Zhang said that his friend was still drunk from the previous night. Indeed, alcohol was a way to cope with the hardship of migrant life.

When, few days later, I described my lunch with Lao Zhang to Dongdong, my local research partner in Beijing, she told me about the yizu (蚁族). The yizu, or ant tribe, is a neologism coined by Lian Si (廉思) a Chinese sociologist who studied the difficulties of young graduates in contemporary Beijing (Lian, 2009). Yizu earn very low wages and

usually live in high-density settlements of Chinese metropolises. In his research, Lian Si captures, through their thoughts (所思), beliefs (所想) and doings (所为), the struggle of these people (Lian, 2009). Lao Zhang was not a young graduate. Nevertheless, the metaphor of the ant seems to describe the hardship of his life quite well. Lao Zhang was a hard worker, struggling for a decent livelihood. In the words of Dongdong, he belonged to the ultimate group of ants.

MYTH, MIANZI AND MODESTY

In the previous part, I have focused on Lao Zhang's livelihood strategies and everyday practices to highlight how invisibility is both an inner characteristic of informal labour and a conscious strategy of workers seeking to improve their material means. I have mainly unfold what I name, inspired by Harvey and Lefebvre, the absolute and relative dimensions of invisibility. Instead, in this second part, I principally investigate the relational dimension of this phenomenon. I therefore focus on the community of waste recyclers as a whole and I particularly examine its inner social relationships as well as its position vis-à-vis the larger urban society. Now, while in the first part I have primarily investigated individual agency, in this second empirical section I investigate collective agency.

As described in the previous section, Lao Zhang came to Beijing from Shandong. This is not a fact of minor importance. During the eighties, when waste recycling developed in Beijing, migrant workers coming from several regions were involved in the industry. However, in the following years this activity became mainly associated with a specific group of migrants. Already at in the nineties, people from the province of Henan, and

particularly from the prefecture of Xinyang (信阳)[43] had acquired a dominant position in the industry (Tang and Feng, 2000). As a result, today migrants from other regions, like Lao Zhang, but still present in the industry, often carry out activities of a lower status, as Lao Wang, a wealthy migrant from the province of the Henan, explains in the following account:

> 'a relatively low level job is to "run from a place to an other" (跑场子). You go to a construction site and you collect materials. Construction waste is relatively abundant, so people going from house to house to collect waste are less numerous. Going from house-to-house is painful and exhausting. Today in Beijing, the door-to-door or residential community collectors are not from Xinyang anymore.'

As a result, people from Henan have increasingly dominated the higher ladders of the business. At the same time a local subculture, reflecting this social group, has also emerged in the industry. This phenomenon plays important functions such as being a vehicle for economic activities and shaping the identity of waste recyclers. Indeed, identity is not an inherited quality of individuals but rather a social construction (McDowell, 2009) and this has important implications in shaping worker agency (Coe and Jordhus-Lier, 2011; Ong, 1991). Beyond the workplace, family and community life are significant elements that contribute to the way migrant workers cope with the hardship of labour as well as the pattern of living in a new place (McDowell, 2013).

In this regard, linguistic and cultural codes construct the physical and the abstract space (Harvey, 2006; Lefebvre, [1974] 1991) of waste recyclers in Beijing. For instance, in the waste market of Dongxiaokou in the northern suburbs of Beijing, the Henan dialect was not only *de facto* the vehicle for business activities, but also the *lingua franca* for everyday

[43] A prefecture-level city in southern Henan province.

activities. It was not difficult to find restaurants that provided regional specialities or direct busses connecting the waste market to cities in Henan.

Figure 3. Restaurants in Dongxiaokou offering the Gushi goose



While the presence of this subculture was visible in the physical space of the informal settlement, it also occupied important symbolic dimensions. A central element that contributed to this was the self-narrative of migrant workers. As explained by Lao Wang, waste recycling is a way for many who possess the qualities of strength and modesty to get out of the poor environment of their home region.

> 'Xinyang is quite far from the centre of Henan, so it rarely receives attention from authorities or supporting policies, public employment is rare. Moreover, the counties near the Dabie Mountains such as Guangshan, Luoshan, Xinxian or Jianjun are the poorest in the whole of China. So, poverty and lack of work pushed us to leave the region to look for opportunities elsewhere.'

Lao Wang explains that for migrant workers seeking fortune in Beijing, the poor background of origin and the qualities to endure the hardship of life are a sort of competitive advantage:

> 'why do people from Henan do this job and Beijing people do not? First of all, because we don't fear suffering. We endure to get up early and to sleep late. Then, we don't care too much about *mianzi* (面子)[44]. Locals know as well that there is money in this business, but they don't want to do it. First, because they are too concerned about mianzi. Then, because they are lazy and they can't endure this work. When you collect waste there is no day or night. Folks from Henan can bear hardship.'

Interestingly, the experience of hardship and the consciousness of the important social function of recycling became elements of pride. The experiences of poverty, humbleness and hard work distinguish migrants from the urban population, providing a 'sense of collective uniqueness and centrality' to the community (Smith, 1986, p.47). These circumstances have therefore important symbolic and moral dimensions. Indeed, following the reform and opening up policies, coastal regions experienced rapid development, bringing about an increase in the standard of living for urban populations. As a result, the comparative underdevelopment of inner regions provided not only the economic rationale, but also the moral justification that brought migrant workers to embrace practices at the boundary between legality and illegality.

While migrant workers lived in cities without the protection of a local *hukou* (Chan, 2015), success in their activities therefore required the ability to deal with a difficult environment and the need to develop a network of complex relationships with local authorities as well as with clients and suppliers. As described in the franker accounts, one element of this complexity is, for instance, corruption. Lao Wang explains that gifts and commissions to local officials are a common practice.

> 'My father and other big market bosses like him usually send gifts to local leaders on the occasion of the spring festival.'

[44] *Mianzi* literarily means 'face'. Here it refers to a concept similar to pride or reputation.

Similarly, bribes are common with managers of client companies, who can raise the price of materials bought by their enterprises, as suggested by Wu Laoban:

> 'suddenly there is a new transportation cost […] it is the importance of knowing people. Here, the door is larger. There are some people that can make money, other that cannot.'

Bribes are not only a way to foster business as in the example above, but also an institutionalised practice that touches upon the life of the entire community. As described in more detail by Wang Laoban,

> 'police can come two to three times a year. You have to give them at least one thousand yuan or even more. Every year they could come two or three times. Around five thousand yuan per year. This kind of grey income is up to more than hundreds of thousands of yuan every year. Everybody gives money. You see these shops, the barber, the restaurant, each one gives at least ten thousand yuan per year. The family of Guo Laoban gives at least hundred thousand yuan per year. They come and they say that your coal stove is poisoning. They give you half a year to fix it, you can figure it out by yourself (你看着办吧). Now the minimum is one thousand yuan. If you don't give it, it is difficult to say what could be the consequence. They will inform the team for public security (治安队). If there is one policeman who comes, then you give the money to him. But if there are many, well it is not easy to give it to them. You don't know who to give the money. […] Even if you don't have any other illegal things, well, you have to give them the money.'

These practices of corruption are not a trait of migrant culture, but rather the result of an era of increasing commodification of social relations (Zhang, 2001). Corruption in contemporary China has become a widespread phenomenon strictly connected with the shifting political economy of the country (Kwong, 2015). Today, bureaucratic power is increasingly used as capital to gain personal benefits (Kwong, 2015) reflecting, to a certain extent, the subordination of petty-capitalists to the ruling class (Gates, 1996). As a result, such a situation is always a manifestation of uneven power relations, as in the case of recyclers and officials. In this blurred area between formality and informality where

waste recyclers have to operate, being part of a community sharing a common history is therefore a very important factor in supporting individuals in their quest for a better life and in coordinating their collective actions.

While it is true that migrants in China are not a homogeneous group (Wong, 2011), worker solidarity is far from being a rare phenomenon (Becker, 2012; Chan, 2012; Chan and Ngai, 2009; Frenkel and Yu, 2015; Tang and Yang, 2008). Indeed, an interclass identity shapes the life of the community of recyclers in Beijing as a whole and is the ground where collective agency is engrained. As pointed out by Wu Laoban,

> 'it is just like you suddenly want to go to Xinjiang. If you don't know anybody you just can't go. But if you know one person, this person can introduce you to somebody else.'

As described above, common roots and social ties play a central social function in supporting newcomers. Moreover, these networks have also increasingly played a complementary economic function of keeping competitors out of the business, 'little by little this has become a barrier to entry' says Lao Wang:

> 'outsiders just don't have a doorway. In this industry you need fellow villagers. We passed through thirty years of hardship, thirty years of experience.'

These stories describe a complex system of shared experiences, memories and values that form a collective identity of a community that has endured the hardship of a life at the physical and social margins. While many migrants still have connections with relatives in their home region, I shall argue that waste recyclers in Beijing have already transcended their roots and built a local sub-culture and economic structure that differentiates them both from the local population and from their home society. It is in this new set of social

relations and livelihood strategies that migrant agency is embedded. Not surprisingly, this phenomenon is also nourished by a common history that has a strong symbolic dimension. This element is crystallised, for instance, in the words of Lao Wang.

> 'The rise of recycling in Beijing has its origins in a school director from Xinyang, who came to Beijing for a petition. A petition can be a very long process. The director soon ran out of money to buy food. He thus started to collect waste bottles and waste plastics and he discovered that this was not bad at all. Later, this activity became a source of livelihood for him. At that time in rural areas, incomes from work points (工分) reached no more than a few yuan. On the other hand, you could make a few tens of yuan or even more collecting scrap. During the spring festival the director returned home and by word of mouth the news spread. So, relatives (亲戚) and fellow villagers (老乡) entered into the business. Year after year, these people brought other folks and in this way they slowly grew in number. From Guangshan (光山) the news spread to Luoshan (罗山), Gushi (固始) and other peripheral counties[45]. Little by little recyclers became more and more numerous.'

This tale has the power of poetry and symbolism, as every myth does in its function of 'anchoring the past into the present' (Cohen, 1969, p.349). Whether the school director is just a fictional person is of minor importance. The image of a cultivated man in search of justice, who becomes the original founder of a community, has all the dramatic elements of a 'mythomoteur', a constitutive narrative of a society (Smith, 1986), which serves to legitimise existing practices (Cohen, 1969), and to bestow, moreover, a sacred dimension on labour. Indeed, similar stories can be found in very different places[46]. Dramatic images contribute in building the identity of a social community, which conceive labour not only as a valorisation process, which often takes the 'annoying shape of plant, machinery, payroll and so forth' in advanced capitalism, but also as the organising element of its existence (Becattini, 2000, p.18): the activity that mediates the metabolism between a social community and nature (Marx, [1867] 1976).

[45] Counties within the Xianyang city territory.
[46] For instance, it is told that a child who discovered the secrets of the accordion from an Austrian pilgrim was the founder of the first workshop in the community that later became the well-known musical district of Castelfidardo in Italy.

CONCLUSION

In this chapter I have engaged with the concepts of invisibility and labour agency. In accordance with approaches that consider everyday practices of workers as the site of their agency, I have described and analysed individual and collective choices around the livelihood strategies of migrant workers in Beijing. Building on Coe and Jordhus-Lier (2011), I have thus suggested that it is useful to disaggregate labour agency into the categories of resilience, reworking and resistance. This approach avoids narrow definition of agents and structures and is productive in examining the heterogeneity of agency across scales and temporalities, as well as its embeddedness in vertical structures and horizontal social relations (Carswell and De Neve, 2013). In other words, this approach adopts the 'point of view of the worker and […] ensures that the worker is not present in the economic analysis as an object of supply and demand in the form of labour power – but as an active economic subject' (Foucault, [2004] 2008, p.223). However, while doing so, this analysis does not adopt categories of neo-classical economics. Instead, it highlights how worker agency, intentionally and unintentionally, contributes towards shaping the geography of capitalism in ways not dictated by capital.

Following this line of argument I have suggested that a productive domain of enquiry is informal labour, both waged and non-waged. I have contended that informal workers, seeking to improve their material existence, contribute to the production of new spatial fixes, which facilitate their social reproduction, and in some cases radically change the rules of the game. Further, I have suggested that the concept of invisibility is a powerful tool in understanding the agency of informal workers. I have defined invisibility as a multidimensional concept. This encompasses phenomena of uneven access to resources and labour for subaltern groups as well as worker strategies to rework and resist

oppressive social relations. The absolute, relative, and relational dimensions of invisibility are therefore in dialectical relation with the concept of labour agency. Invisibility constrains and fosters agency, and it represents, therefore, a powerful device to analyse the labour process under capitalism.

I have thus given account of everyday practices of waste recyclers in Beijing, a group mainly composed of migrants from rural regions. I have shown that their individual and collective acts are motivated by the aspiration of regaining control over their labour time in the spheres of production and reproduction. While intentionally turning to informality to improve their material means, migrants contribute to rework and resist oppressive capitalist social relations. In this regard, I have suggested that this process is characterised by its invisibility. This refers both to the marginalised condition of migrants and to their conscious strategy to exploit this feature at their advantage. In this struggle for a better livelihood, informal workers shape the physical and economic space in ways that facilitate their self-reproduction and create a brand-new spatial fix. I have suggested that this framework of operation is characterised by its own economic structure as well as linguistic and cultural codes that differentiate migrants from the urban society and give a sense of uniqueness to their community. It is in this new set of social relations that their labour agency is embedded.

VARIEGATED GEOGRAPHIES OF ELECTRONIC WASTE

CHAPTER 7

'A belief in spontaneous progress must make us blind to the role of government in economic life. This role consists often in altering the rate of change, speeding it up or slowing it down as the case may be.'

Karl Polanyi*, The Great Transformation,* (1944, p.39)

INTRODUCTION

While in the previous parts of the thesis I have adopted a territorial perspective, i.e. focusing on regions as loci of economic activity, in this chapter I embrace a sectorial perspective. I examine a specific category of waste, namely e-waste (Waste Electrical and Electronic Equipment, also WEEE). Also, I make a shift concerning the domain of investigation. While in previous chapters my analysis has mainly focused on places and people in the informal economy, in this chapter and the following one, I focus on actors and organisations mainly operating within official governance. This change of perspective is a conscious strategy that I adopt to better highlight agency over structure, and to therefore examine the variety of actors in a fragmented economic and political system.

In recent years, in literature on geographies of waste (Moore, 2012), studies on e-waste have formed an influential subfield (Pickren, 2014; Pickren, 2015; Pickren, 2014a). As pointed out by Lepawsky, e-waste represents a difficult object for definition, materials

management and policy (Lepawsky, 2013). This instability of electronic discards makes them the site of contrasting imaginaries and narratives of waste as well as the locus of alternative conceptions of value. The focus on these unusual objects therefore represents fertile ground on which it is possible to highlight a number of central questions in political economy and contribute, more generally, to fostering our understanding of the uneven geographies of contemporary capitalism (Lora-Wainwright, 2016). Indeed, the growth of research on e-waste reflects an interest in the subject that crosses the boundaries of critical geography. As noted by Pickren (2014), articles in this heterogeneous and novel literature often begin with a portrait of the rapid growth of this category of discards in order to situate the issue within a larger context. A common argument is that the continuing expansion of the global market for Electrical and Electronic Equipment (EEE), together with the rapid obsolescence of products, has led to an explosion in electronic scrap over the last few decades. Consequently, electronic discards are identified as the fastest growing segment of solid waste and it is suggested that they generate critical challenges for their treatment and final disposal, because of the wide range of hazardous substances[47] contained within (China Water Risk, 2013; Greenpeace International, 2005).

Official narratives often suggest that e-waste produced in the Global north is dumped or improperly treated in the Global south (Puckett Jim et al., 2002). Thus, this dominant narrative depicts e-waste in terms of a consumption problem with a post-colonial flavour (Lepawsky, 2013). Reports outline the poor conditions in which the treatment and final disposal of e-waste is operated in the informal economy (Puckett Jim et al., 2002). At the same time, multilateral organizations encourage research and programs aimed at studying and establishing formal e-waste management systems in developing countries (Wang et

[47] Such as lead, cadmium, mercury, hexavalent chromium, barium, and beryllium among others.

al., 2013) in order to reduce the severe social and environmental externalities that the informal e-waste treatment is usually accused of generating. While this dominant discourse fosters a Malthusian fear (Lora-Wainwright, 2016), it usually proposes, at the same time, a potential solution in the establishment of 'modern' e-waste management systems, strongly opposing informal modes of recycling, which are usually accused of being a source of severe social and environmental externalities (Baldé et al., 2015). This twofold narrative is mobilised, in a technocratic fashion, to inform public policies and justify policy interventions. However, as suggested by Robbins ([2004] 2012), every narrative is intrinsically political. As such, so is the story of electronic discards, which contribute towards creating imaginaries that see e-waste as a consumption problem and fetishize particular modes of recycling (Pickren, 2014a). Indeed, official discourses often overlook the inextricable mix of attributes (Tong and Tao, 2016), which make e-waste not only a post-consumption problem but also a phenomenon with relevant political and social implications (Lora-Wainwright, 2016).

In recent years, although most countries have implemented legislation for the establishment of e-waste management systems, practices of 'outsourcing' have effectively occurred (Lora-Wainwright, 2016). In spite of international conventions (BAN, 2002), electronic discards are today exchanged, collected, and treated on a global scale (Lora-Wainwright, 2016). However, the linkage between transnational flows and illegal dumping is only one part of the story about the trade of e-waste and this sole understanding, as pointed out by Kirby and Lora-Wainwright (2015), is indeed a misconception of the phenomenon. As argued by Shultz and Goldstein, flows of e-waste are often driven by the quest for functioning and reparable devices, spare parts, and recyclable materials, rather than by the attempt to elude regulations for the final disposal of electronic discards (Lepawsky et al., 2015). While the presence of rare raw materials in

end-of-life appliances makes these unusual commodities the starting point for new rounds of production and consumption (Wong, 2015), the possibility to repair electronic devices for second-hand markets also disrupts conventional understandings of economic activities (Lepawsky and Billah, 2011). The study of electronic discards is therefore productive in investigating the blurred and ever-changing boundary between waste and value (Reno, 2015; Reno, 2009).

As pointed out by Pickren (2014), geographical research on e-waste has investigated three interrelated themes in particular. The first focuses on the study of material flows (Herod et al., 2013; Kirby and Lora-Wainwright, 2015; Lepawsky and Mather, 2011; McGrath-Champ et al., 2015; Tong and Wang, 2004). This strand of research has showed how the circulation of e-waste is not only a global interregional process, but also, and mainly, an intraregional phenomenon in the Global south (Lepawsky, 2015a; Lepawsky, 2015). The second has examined informal economies around the trade of discards and mapped their value chains (Herod et al., 2013; Pickren, 2015; Wong, 2015). Research around these two subjects especially has contributed to literature on global production networks and commodity chains and has been a productive corrective to the understanding of waste as the end point of economic activity (Hudson, 2008; Pickren, 2014). Finally, research on the third theme has mainly been concerned with issues of governance of waste markets as well as processes of transition towards 'formal' management systems. These studies have produced powerful critics of development regimes and public policies aimed at reducing environmental and social externalities of the mismanagement of electronic discards (Lawhon, 2013; Lawhon, 2012; Lepawsky, 2012; Lora-Wainwright, 2016; Reddy, 2013; Schulz, 2015).

While in the previous chapter I have mainly investigated, through different avenues, the first two themes, in this chapter I directly address the third theme of research. Investigating the implementation of public policies associated with recycling is, indeed, fertile ground for exploring conflicting practices of representation, i.e. 'discursive processes through which objects and actions come to have a social meaning' (Pickren, 2014a, p.32), narratives that underpin specific development regimes (Lawhon, 2013; Lora-Wainwright, 2016; Schulz, 2015), and the role of laws and regulations in defining the categories of waste and value (Lepawsky, 2012; Kama, 2015).

In this regard, as correctly pointed out by a number of scholars, the establishment of formal management schemes for electronic discards, while framed in terms of an environmental issue, often has far reaching economic and political consequences creating specific circuits of waste and value through the coercive power of law (Kama, 2015; Lora-Wainwright, 2016; Schulz, 2015). The shift to formal management systems modifies flows of materials, but also reworks conceptions of value and labour. The restructuring and enclosing of circuits of waste, via the introduction of machinery, large-scale industry and formal wage-labour, involves the shift to capitalist mechanisms and social relations. However, this phenomenon is always embedded in geography and therefore appears in variegated forms (Brenner et al., 2010). I thus argue in this chapter that while this change, which has been defined in the literature as a shift towards a neoliberal governance and multinational trade (Kirby and Lora-Wainwright, 2015), is effectively occurring in China, it is in fact influenced by the dimensions of time and space. The final result of this process is inherently branded with Chinese characteristics. Indeed, while neoliberal forces accelerate processes of commodification and marketization, they also increase the uneven geographies of capitalism when blended with different political and social contexts. Therefore, I suggest that while neoliberal forces are at play in China,

neoliberalism as a framework of analysis is not a sufficient tool to understand the changes in the economic and institutional structure of the country in general, and of the domain of e-waste management in particular. As pointed out by Brenner and colleagues, neoliberalism has become a rascal concept, 'promiscuously pervasive, yet inconsistently defined, empirically imprecise and frequently contested' (Brenner, et al., 2010, p.182). Therefore, I suggest in this chapter that the variegated capitalism approach is a better-positioned tool to push forward our understanding of economic geographies e-waste.

While global pressure boosted the implementation of new policies and regulations in the domain of waste management (Tong et al., 2015), Chinese legislators introduced concepts of Extended Producer Responsibility (EPR) and reverse logistics inspired by EU directives (China RoHS, 2006; China WEEE, 2009; China WEEE Governmental Fund, 2012) in order to build, as usually suggested, a similar system to the European model. Nevertheless, as I show in this chapter, this process eventually created a different system. In my opinion, rather than just explaining specific imaginaries of e-waste and environmental management, this outcome also unveils, interestingly, conceptions of the economy and its regulation, and teaches us something about the peculiar relationship between the state and society in China, contributing to our knowledge in geography and Chinese studies.

In this regard, the implementation of the Chinese e-waste formal management system is a fertile ground of investigation. In this chapter I contend therefore, building on existing literature, that the formalisation of the industry corresponds to an institutional transformation that favours the interests of global capital, through the establishment of large-scale companies at the expense of small traditional recyclers. However, I also suggest that this process unfolds in a particular geoinstitutional combination that did not

create homogenisation or conversion with European regulatory frameworks, but rather a new model. I therefore contend that, drawing on Polanyian economic geography (Brenner et al., 2010; Peck, 2013), in order to gain a deeper appraisal of this phenomenon, which is correctly understood as a neoliberal adjustment (Kirby and Lora-Wainwright, 2015), it is important to take into account the variegated and uneven dimensions of its unfolding.

Therefore, in this chapter, I uncover the black box of the Chinese formal waste management system. I particularly focus on the implementation of what is usually defined as an Extended Producer Responsibility scheme. Both technical and critical accounts on e-waste usually take for granted the idea that China is implementing such a system. While the formal management system for e-waste is often described as such in the official discourse, academic papers, and press, I argue that it would be better understood as a state-funded scheme. This is not a minor point. EPR is not a tool, but rather a policy principle and can be consequently enacted with many combinations of instruments (Massarutto, 2014). Moreover, it 'intersects with and maps onto existing modes of production, along with extant "modes of governing" waste' (Hobson, 2015, p.6). Therefore, the way the EPR principle has been enacted in different countries reveals their particular legal and cultural traditions (Tong and Yan, 2013), and thus tells us something about the economy and its regulation across geographical landscapes.

In addition, I also contend that the design of WEEE policies in China has not been the result of a straightforward development, but rather the evolution of a complex political process. In the shaping of the formal waste management system, different ministries, government agencies, research institutions and the industry, as well as local and international environmental NGOs, were promoters of contrasting ideas on how the

system should have been implemented. I thus describe and analyse this process giving account of some of these contrasting perspectives, and I suggest, building on Mulvad (2014), that their respective promoters foster different 'state projects' (Jessop, 2010). In so doing, I seek to contribute to the effort of identifying some of the mechanisms at work in modelling the Chinese state-economy nexus (Mulvad, 2014).

To push forward this argument, I present my empirical material in the following parts of this chapter. This is informed by long-term ethnographic research, carried out over a period of two years. In China, I have recorded independently, and in collaboration with local academics, 42 interviews as well as hundreds of informal conversations with actors in the recycling industry (formal and informal), officials, journalists, activists, and academics. Moreover, I had also previously carried out comparative fieldwork in France, where I conducted semi-structured interviews with major actors of the e-waste management system as well as academics working in the field.

FAR EAST AND FAR WEST

Since the beginning of 1980, when the reform and opening up policies brought about a transition towards market economy, the localisation of segments of the global production network of the electronics industry contributed to the rapid economic growth of southern and coastal areas in China (Tong and Yan, 2013). At the time, China was still in the early stages of transition to a market economy. Most materials were controlled under the planned economy and were allocated to a restricted number of state-owned companies. Therefore, it was difficult for the new burgeoning industry to get supplies of the needed products through official channels (Tong and Wang, 2004).

While demand for raw materials and functioning parts for the local markets intensified, a lively recycling sector emerged during those same years (Tong and Wang, 2004). The secondary processing of electronic discards, which were increasingly flowing into the country, represented therefore a convenient and cheap solution to fill the demand in material resources (Tong et al., 2015). As a result, small recycling businesses played a dramatic role in sustaining the rising electronics sector and fostering rural industrialisation at the same time (Tong and Wang, 2004). Local governments eventually appraised recycling enterprises as an engine of economic growth (Lora-Wainwright, 2016).

Guangdong was one of the Chinese provinces that benefited the most from this renewed climate and in a few years became a global manufacturing hub (Lora-Wainwright, 2017). Here, large scale manufacturing complexes arose side by side with small family home businesses embedded in kinship and family networks (Lora-Wainwright, 2016). Guiyu, a town in the eastern region of Guangdong, gradually developed into a huge agglomeration economy for the secondary processing of electronic scrap and other discards (Lora-Wainwright, 2016). Recycling activities developed steadily in southern China, as well as in other Chinese provinces throughout the nineties, but received a severe blow towards the beginning of the new millennium. Environmental pollution and precarious work conditions in the industry were targeted by a number of international environmental organisations that produced reports on the industry in Guiyu (BAN, 2002; Greenpeace international, 2005). This trigged more proactive measures by the government in the domain of environmental governance. However, as noted by Tong et al. (2015), before the dramatic international exposure that China received from those reports, a number of policies to control environmental pollution caused by unregulated recycling activities had already been enacted in some localities. These policies were mainly focused on imports

of e-waste and the control of environmental pollution (Tong, et al., 2015). The exposure on the global scale, however, brought about acceleration through the process of reform.

Accordingly, since the beginning of 2000s, China has gradually implemented a number of policies in the domain of e-waste recycling. These were driven by the overall objective of formalising the sector, through the introduction of an EPR system, the rising of environmental standards as well as the establishment of large-scale and cutting-edge technologies for the treatment and final disposal of electronic discards. While I will examine these policies in the following pages in more detail, for comparative reasons I outline, in the following paragraphs, the EPR system as implemented in the European Union.

For a Few Dollars More

Extended Producer Responsibility is a policy strategy that first emerged in Sweden and Germany at the beginning of the 1990s (Lifset et al., 2013). It was promoted as a way to create incentive for eco-design, internalise cost of waste management (Lifset et al., 2013), improve resource efficiency (Massarutto, 2014), and integrate reverse logistics into the redesign of value chains (Lindhqvist, 2000). The definition given by the OECD, which is usually adopted as the baseline in academic literature and legislation, describes EPR as an 'environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle' (OECD, 2016).

The core principle of this approach is that the costs, and in some cases the operational responsibility, for the recycling of waste should be shifted to producers, who are

responsible for the material characteristics of products (Lifset et al., 2013). The promise of EPR is that this strategy brings improvement in the eco-design of commodities, fights planned obsolescence, and promotes reuse. So far, EPR has been adopted in national legislations in Europe for a number of waste streams. In the last decade, this approach has been largely implemented in the field of waste electrical and electronic equipment. For comparative reasons, in the following paragraphs, I briefly outline how this policy strategy is conceived in the European directives, before examining how it has been enacted in China.

In Europe, legislation on e-waste was introduced at the beginning of 2000s in the 2002 WEEE directive (European Commission, 2003), then recast ten years later (European Commission, 2012). The Waste Framework Directive, which sets the baseline for all European legislation focusing on the management of different waste streams, defines Extended Producer Responsibility as 'one of the means to support the design and production of goods which take into full account and facilitate the efficient use of resources during their whole life-cycle including their repair, re-use, disassembly and recycling without compromising the free circulation of goods on the internal market' (European Commission, 2008, p.6).

The WEEE directive[48] integrates this principle and establishes that producers are individually responsible for the financing of e-waste recycling but that this obligation can be fulfilled individually or by joining a collective scheme. The original spirit of the EPR approach was aimed at making producers responsible for their own products, in order to incentivise eco-design (Lifset et al., 2013). In practice, however, the dominant model that has emerged in European countries has privileged an interpretation of this principle that

[48] In article 12.3 of the 2012 WEEE directive.

favours the establishment of collective schemes (Calliafas et al., 2012). This has resulted in a system where manufacturers, mechanically transferring fees for their share of the market[49], delegate their responsibilities to collective schemes, known as Producer Responsibility Organisation (PRO), that act on their behalf.

PROs are in charge of reclaiming fees from manufacturers, monitoring the collection of e-waste flows, and coordinating logistics and recycling activities (Bahers, 2014). They are the key players of the system. On the one hand, PROs accumulate large sums of financial recourses deriving from producer fees. On the other hand, they benefit financially from the ownership of discards, which they can resell to the recycling enterprises offering the best price. As frankly recognised by the president of one of the major PROs in France in a personal communication, this mechanism eventually resulted in the odd situation of letting collective schemes accumulate 'hoards of gold'. Not surprisingly, this system has been the target of wide criticisms, both from accounts within the field of industrial ecology and more broadly from other disciplines in the social sciences (Flipo, 2009). I outline below two major points raised in these works.

First, it has been argued that because the financial costs for recycling are internalised in the prices of products, EPR eventually resulted into a model that could be better described as an 'Extended Consumer Responsibility' system (Flipo, 2009; Lepawsky, 2012; Pickren, 2014). As pointed out by my informant (the president of a French PRO) quoted above, this is something that cannot easily be avoided, because 'no matter what kind of tax you create, producers will always transfer it to consumers'. Also, as pointed out by Lifset et al. (2013), EPR opponents usually contend that reusing may be discouraged in the face of incentives that are given to recycling.

[49] In some countries, such as France, minor modulations on contributions and penalty fees are accorded if a number of eco-design criteria are respected.

Conceived in this manner, the system accelerates the flow of materials rather than extending the life span of commodities. Receiving a financial benefit from producers' fees of electronics placed on the market as well as from the reselling of e-waste for material recovery, it seems very unlikely that PROs will promote reusing over recycling, a practice that will slow down this flow of material, and thus limit their benefits. Moreover, PROs are nothing more than consortiums of electronics producers, acting on their behalf. As a result, this fact represents another deterrent to the refurbishment of commodities for the second-hand market, because as it can be easily understood, this means an increasing source of competition for the electronics market.

Unsurprisingly, a recent report shows that less than 2% of the total appliances collected by official schemes in Ilê-de-France[50] were refurnished and reused in 2011 (ORDIF, 2013). These numbers correspond almost entirely, to e-waste collected by the solidarity economy. The bulk of the trade circulating through PRO channels was sold for material recovery (ORDIF, 2013). While it is understandable that only a share of appliances, due to their diverse material conditions, can be effectively refurbished, the figure of 2% appears, nevertheless, to be quite low. In brief, EPR in the European Union, and wherever else this approach has been implemented following the same rationale[51], turned into a system that has less to do with promoting eco-design and reuse, and more to do with mechanisms to finance collection and recycling of e-waste (Flipo, 2009; Lepawsky, 2012).

Kärg Kama has examined the twofold logic that underpinned the policy intervention described above. Here, what she calls the 'logic of hazard', i.e. the idea of e-waste as a social and environmental externality, is the rationale behind the complete banning of

[50] The greater Paris area.
[51] For instance in the United States.

transboundary trade of e-waste. However, a 'logic of resource', which defines waste as a bearer of valuable materials, is pivotal to incentivise national governments and the industry to adhere to formal schemes as well as to create and maintain market demand (Kama, 2105). The idea of 'circular economy', 'a somewhat maverick theory adapted from industrial ecology and popularised in China' (Kama, 2015, p.19), guides the implementation of e-waste regulations and ties the two logics described above. The core argument is that when waste is processed close to the point of its production, processes of recycling limit the environmental and social externalities of its mismanagement and metamorphose waste into a resource. European regulations thus establish a linkage between environmental protection and long-term economic restructuring (Kama, 2015). However, Kama correctly points out that this framework confines the movements of e-waste to the territory of a single market, legitimising the spatial enclosure of the trade within specific formal economic circuits and modes of recycling (Kama, 2015). The logics of hazard and resource appear therefore as mutually constitutive and pivotal to the territorialisation of exchanges as well as instrumental in the definition of the categories of waste and value (Kama, 2015). Similarly, Lepawsky and Mather (2013) suggest that legislators in the United States contributed to defining the categories of waste and value almost overnight, turning discards into green gold. Juridical and semiotic processes are thus central in the reworking of meanings attached to commodities that reach the end of their socially useful life as conceived by their original purchasers (Hudson, 2005), and in the shaping of recycling economies associated with them (Alexander and Reno, 2012). In the following part, I show how these dynamics have emerged in China, but also how they are constrained by the particular historical and geoinstitutional context of the country.

The Good, the Bad and the Ugly

The introduction of EPR legislation in China is a process that has gradually taken place in the last decade (Tong et al., 2015). The principle has been first integrated in the Circular Economy Promotion Law in 2008 and subsequently in the Ordinance on the administration of the recovery and disposal of waste electrical and electronic products (China WEEE, 2009), known as the 'China WEEE' (Tong et al., 2015). Later, in 2012, China implemented a governmental fund (China WEEE Governmental Fund, 2012) to collect fees from producers in order to finance the establishment of a formal management system for the recycling of electronics (Zeng et al., 2013).

Figure 1. Workers dismantling CRT TVs in a formal company in Guiyu, Guangdong, China



Similarly to the European Union, financial resources are generated from producers and importers, who are subjected to a fee on each item placed on the market. Fees are collected by local taxation and custom bureaus and then transferred into the governmental fund (Zeng et al., 2013). The money is then used to subsidise recycling companies, certified by the Ministry of Environmental Protection (MEP). This is a group of 109 enterprises[52], usually found in technological zones or large scale recycling complexes (CHEARI, 2015). The latter in some cases also incorporate a small number of workshops, which were previously operating informally.

The implementation of the waste management system is characterised at least by two elements that are particular to China. The first is a historical factor and refers to the presence of a lively informal economy around the trade of electronic discards (Li et al., 2012; Li et al. 2012a). Research that has investigated the informal economy in China from the perspective of management and public policy usually holds to normative arguments (Chi et al., 2011; Wang et al., 2010; Zeng et al., 2013). Some works have highlighted the social and environmental externalities of these activities and have an overall negative judgement on this economy. They are, therefore, robust promoters of the formal system based on machinery and large plants (Liu et al., 2006; Xue et al., 2013). Other studies, however, such as the one by Li et al. (2012a) have a more nuanced judgment on activities usually labelled as informal. They show that the informal economy, while using relatively low cost transportation as well as labour intensive technologies for the collection and treatment of e-waste, is home to a number of competitive advantages from which official systems should learn (Li et al., 2012). Moreover, Li and colleagues suggest that informal activities generate many job opportunities, produce economic benefits for local communities, and eventually reduce

[52] The number refers to data available in mid 2016.

the financial burden for the official waste management system (Li et al., 2012; Li et al., 2012a). Similarly, other studies point out that efficient informal networks should be integrated into formal e-waste management systems (Chi et al., 2014; Tong and Yan, 2013; Yu et al., 2010). These networks are indeed widespread throughout the country, as also recognised, in a personal communication, by the manager of a formal private company operating in Beijing.

> 'First of all, from the perspective of collection, informal recyclers occupy almost the totality of the market, even if they don't have official licences. I estimate that in the short term, one or two years, this won't change much. As far as they are involved in the collection, but not in the dismantling, they do not produce any environmental pollution. However, for them there are two main challenges. The first is that they don't get a subsidy. The second is that administrative departments might control or restrict their activities.'

In addition to noticing the central role played by the informal economy in collecting old appliances, the quote above also associates activities carried out by informal actors with environmental pollution. Peter Kirby and Anna Lora-Wainwright underline how this framing of the e-waste issue brought about a distorted understanding of the phenomenon, which biases how electronic discards are conceived and appropriated in the informal economy (Kirby and Lora-Wainwright, 2015). The scholars suggest that the narrative that associates the secondary processing of materials in the informal economy with environmental pollution is a powerful vector for spreading negative imaginaries of the e-waste trade[53]. As argued in previous chapters, informality and formality are socially constructed concepts, rather than ontological categories (Schindler, 2013). They are defined in legislation as well as through the everyday practices and struggles of different empowered actors (Schindler, 2013). The use of these terms is therefore never neutral.

[53] They even suggest that the term 'scavenging', often associated with informal activities, reinforces this negative judgment. As a corrective, they propose, while referring to the informal economy, to substitute the word 'scavenging' with 'scalvaging', a composite term of 'scavenging' and 'salvaging', which describes the e-waste trade in a more neutral manner (Kirby and Lora-Wainwright, 2015a).

Imaginaries constructed around them are instrumental in shaping circuits of waste and value and therefore have important material and financial consequences (Schulz, 2015). As Schulz correctly argues, the validation of technologies and actors allowed to operate in recycling activities defines what e-waste is, where its value rests, and who is entitled to make use of it (Schulz, 2015). While informality is often framed in terms of an environmental problem, as in the quote above, this understanding masks the twofold nature of discards as waste and commodity as well as the positive externalities that the trade of e-waste generates (Lepawsky and Billah, 2011; Lora-Wainwright, 2016).

Addressing e-waste in general terms also takes into account its multifaceted reality that includes a wide range of objects with heterogeneous characteristics (Schulz, 2015). Some devices are complex objects to recycle, other can be easily dismantled and cause little damage to the environment (Schulz, 2015). As correctly pointed out by the Swiss scholar, this shallow understanding of the issue masks the variety of practices existing in the informal economy, while at the same time submits them to an overall negative judgement (Schulz, 2015). Indeed, some informal activities are clearly dangerous for the health of workers and the state of the environment. However, others, often performed manually and aimed at reclaiming reusable parts from old devices, are paradoxically more environmental sound than 'modern' automatized methods of recycling based on shredding (Schulz, 2015).

Furthermore, the account of the manager quoted above also suggests that the establishment of the formal system for the management of electronic discards represents a source of competition for traditional actors operating in the system. Indeed, the transfer of economic incentives to certified companies, here in the form of a subsidy, gives a competitive advantage to these entities (Schulz, 2015). As suggested in previous

chapters this shift can be understood as a process of primitive accumulation. To date, however, formal and informal companies have mainly operated in parallel markets rather than in direct competition. Certified enterprises have almost exclusively recycled discards that have little economic value on the market[54]. By contrast, a large part of the informal trade of electronic discards is driven by the value of functioning appliances or components (Li et al., 2012a). As explained by the director of one of the major state-owned companies involved in the industry,

> 'the informal sector certainly has an influence [on the activities of formal companies]. However, this does not come from the second-hand market. Comparatively, the second-hand market doesn't have a huge influence, because what we are now recycling is mainly products that cannot be reused or have little economic value. However, it certainly has an influence. Informal companies break the rules. They do not have to pay insurance for the workers and their equipment is less expensive.'

As the quote above suggests, the direct competition to the formal recycling system does not come from actors that 'scalvage' for reusable appliances and profit from their trading in the second-hand market, but rather from activities of material recovery that are performed informally by networks of small-scale companies. These are often portrayed in official reports as producing strong environmental and social externalities (Baldé et al., 2015). This straightforward narrative focusing on environmental and social justice tends to represent populations involved in informal recycling as both oppressors and victims of industrial pollution (Lora-Wainwright, 2016). However, as pointed out by Lora-Wainwright, this perspective fails to understand the complex ways in which communities make sense of pollution and find compromises to balance harm with the necessity of work, home, education and other major needs (Lora-Wainwright, 2016).

[54] Such as CRT televisions.

This tension between value and harm explains the mixed reactions that communities and local governments had to the implementation of stricter management rules for the recycling of electronic discards and the eventual shutting down of businesses carrying out these activities. Today, e-waste recyclers and their communities are victims of their own success (Lora-Wainwright, 2016). While in previous years their economic model fitted with the rhetoric of the time, today their development regime is discursively produced outside the new imperatives of 'ecological civilization', 'circular economy', and 'scientific development' (Lora-Wainwright, 2016).

Figure 2. Workers dismantling mobile phones in an informal workshop in Guiyu, Guangdong, China



As a result, informal recyclers are identified as obstacles of progress and thus transformed into outcasts. They are disconnected from future steps of development and their activities are substituted with technologies that better fit the contemporary narrative

of modernisation (Lora-Wainwright, 2016). However, as also contended in the following chapter, this situation should not be understood as a mechanical outcome, but rather as the result of a political process where different empowered actors confront each other. As suggested in the quote below, alternative visions on the reform of the industry exist between the officials who took part in the policy design.

> 'Concerning waste recycling, non-official channels are extremely vital […] because non-official actors look at the problem from the point of view of resources. Their material flow is extremely good, because, I think, they look for economic value. The value flow is also very good. Every flow of materials can realise an increase in value. It flows according to the law of market. It is very smooth. However, there is a problem, their environmental impact[55] is not good. This environmental problem must be considered as a common issue. I believe that public institutions[56] should bear this responsibility. When we designed the system, we wanted public institutions to care about this point. However, the government decided to implement a producer responsibility system, the polluter pays principle. For instance, in the case of e-waste, producers have to bear the responsibility. However, I believe that the money taken from producers should be given to informal recyclers. It should be a system of this kind. So when we first implemented the system, I believe that we shouldn't have subsidised these big scale companies, but upgraded the informal recyclers, using the money from producers to subsidise informal recyclers and solve their environmental problem. This system would have been much better compared to what we have implemented. This is my point of view.'

The account above comes from a top Chinese academician in the field of industrial ecology and director of an influential research institute in China. At the moment of this personal communication, the scholar was very close to official circles and had already participated in the design of a number of national policies focusing on waste management and recycling. Interestingly, this opinion provides a critical voice, which particularly addresses the establishment of the subsidy for recycling companies, in the panorama of Chinese reformers. The quote is useful in highlighting at least two major

[55] Literally, environment protection flow (环保流).
[56] Literally, the government (政府).

points. Firstly, it shows that complex politics exist around the establishment of the e-waste management system in China and that different ministries, agencies, research centres, representatives of the industry, and the like are supporters of diverging interests, some of them not necessarily in opposition with the presence of small scale recycling operators. Secondly, the account provides a critical perspective on another major point, namely the establishment of the governmental fund, that I will analyse in the following pages. This, I believe, is of central importance in understanding how the architecture of the formal management system in China differs from the one in Europe, and in how this fact reveals the particular mechanisms of the state-economy nexus in China (Mulvad, 2014). However, before analysing this second point, in the following paragraphs I focus on the first issue raised by the account above.

The quote suggests that contrasting interests exist in the industry as well as between official bodies involved in the institutional design. While it is difficult to comprehensively outline the complexity of these politics, I believe that it is worth presenting one example that could shed some light on these dynamics. This example focuses on the involvement of the Ministry of Commerce (MOFCOM) in policy design. MOFCOM was a key actor in the wake of the formal management system. It had been in charge of the implementation of a number of measures, in particular of a well-discussed policy, known as the 'old for new'[57] plan (Tong et al., 2015). The policy was implemented in 2009 and had a twofold rationale. On the one hand it was aimed at promoting domestic consumption in order to cope with the 2008 financial crisis, and on the other hand it aimed at diverting old appliances into formal channels of collection. According to the plan, consumers received a discount of 10% of the total price of new electronics bought in exchange of their old commodities (Tong et al., 2015). While this system resulted in a

[57] 家电以旧换新计划.

significant outflow of public funds, the results of its implementation were somewhat contested by other ministerial agencies involved in the planning of the waste management system. According to a high-ranking official from the Ministry of the Industry and Information Technology (MIIT), at the time of the 'old for new' policy, formal companies were not equipped with the technology to recycle the variety of products that the plan targeted. Moreover, the overall results of the plan were somewhat mixed and the policy was eventually abandoned as it was considered counterproductive, as suggested by the same aforementioned informant:

> 'The old for new policy was not aimed at collection, but rather at increasing interior demand. It was aimed at stimulating consumption. This measure not only did not have any significant effect in increasing the rate of collection, but it even had the opposite result. It was like saying to people (老百姓) that their discards had a value. Indeed, what we need to promote is rather the contrary, the fact that waste recycling has a cost, because there are many environmental responsibilities that has to be taken into account.'

While the policy promoted by MOFCOM was finally abandoned, the ministry was also in disagreement with the design of the China WEEE ordinance published at the end of 2009 and promoted by the National Development and Reform Commission (NDRC). According to the same informant quoted above, representatives from the Ministry of commerce

> 'were not in accordance with the guidelines of the China WEEE ordinance. So at the moment of its implementation, they refused to subscribe to it.'

Whether the dynamics described above effectively correspond to what really happened, these accounts clearly suggest that different official agencies were promoters of

alternative state projects and that the implementation of the system was not a straightforward outcome, but rather the result of a historical process.

Similar dynamics also appear in the implementation of the governmental fund. I believe that this specific choice of institutional design is a central point that differentiates the Chinese model from the European system and is worth analysing it further. Whereas in Europe the system is constructed around the role of PROs as explained in the previous pages, in China the key actor in the management of financial resources obtained from the fees of electronic products placed on the market is the state, through the means of a governmental fund under the Ministry of finance. As pointed out by Rafael Veit, this is a major characteristic that defines the system as a state-funded model rather than a typical EPR scheme (Veit, 2014). This is not a mere matter of classification, but rather a central point that sheds light on a major mechanism at the nexus between the state and society in China (Mulvad, 2014). All in all, this concerns the management of billions of public funds each year.

As suggested by a manager of a well-known multinational company operating in the domain of electronics in China, the MIIT and some branches of the industry have long lobbied the National Development and Reform Commission against the establishment of a governmental fund and in favour of the implementation of a PRO. As often argued by representatives of the industry, the fund functioning is not transparent, and what's more, is designed to particularly target large producers, with the consequence of creating a large number of small local free riders.

> 'I can understand that there are many difficulties for the government in implementing these regulations, because there are many small companies that are difficult to control. For instance, local manufacturers are required

> to report quarterly to the tax bureau. So, [the system] requires producers to report their sales volumes, but if they don't report these numbers it's difficult to find them. They are quite small. So the government is trying to grab the big ones. The big companies, because we have a bigger market share. So we can guarantee that almost 70% of the market is under control. I think this is quite unfair.'

Another common complaint from the electronics industry is that while producers are charged according to the products placed on the market, how this money is effectively used is not clear to them. Firstly, there is no direct link between the products charged and the products recycled. Secondly, the system does not provide the possibility of implementing alternative solutions, such as individual schemes. It is therefore often argued whether Chinese legislators implemented the Extended Producer Responsibility principle in the design of the e-waste management system in the country. In order to avoid the current situation, as explained by several of my informants and as anticipated above, in the wake of the design of the system, representatives from the MIIT were strong promoters of the establishment of a PRO, as in the European model, and supported the implementation of compensation rules on producer fees for manufacturers who integrated eco-design criteria in the production of their products. However, the project of implementing PROs eventually failed. In a remarkable Polanyian statement, the director of a major Chinese research centre in the field of electronics who was close to policy circles, suggested during a personal communication that the reasons for this outcome lay somewhere in the realm of culture

> 'European and Chinese cultures are different. Why do you think that when the system was first planned, China opposed the idea of a PRO, and instead established a national fund? If the state (政府)[58] acts as a PRO then the system is extremely flexible. Its operations are very flexible. However, if there is a third party, well everybody sees, every year these PROs would receive several billions… several billions in subsidies. Now, these several billions… the risk is quite high.'

[58] Literally, the government.

While the establishment of a formal waste management system in China has brought an institutional transformation in the direction of a neoliberal policy adjustment, this change has however been characterised by local factors. The policy reform is engrained in a particular geoinstitutional and cultural context that constrains its dynamic. The process unfolds, as suggested in the quote above, in its own terms. The particular institutionalised compromise reached in China has therefore created a spatio-temporal fix (Jessop, 2014) that has at its core the state as a key actor. This solution, built around the establishment of a governmental fund, regulates the diverging forces produced by the pressure towards a neoliberal adjustment and the resilience of a *dirigiste* state (Fligstein and Zhang, 2011).

On the one hand, this transition appears as a redefinition of circuits of waste (and value) in favour of global capital, through the creation of large-scale complexes for the recycling of e-waste, and against the interests of local traditional businesses operating in the sector. As argued in critical literature on the subject, this has brought about a shift towards neoliberal governance (Kirby and Lora-Wainwright, 2015). On the other hand, this process is inherently branded with the Chinese characteristic of a strong *dirigiste* state where the model adopted differentiates with the system implemented in Europe. Therefore, I contend that while interpreting this change through the lenses of neoliberal governance is correct, a deeper understanding of this process needs to take into account the variegated and uneven geography of the phenomenon. As pointed out by Brenner et al. (2010), neoliberalism has become a somewhat rascal concept, 'promiscuously pervasive, yet inconsistently defined, empirically imprecise and frequently contested' (Brenner et al., 2010, p.182). While Brenner and colleagues suggest that the term should be retained, they also advocate for a 'critical investigation of patterns of market oriented regulatory restructuring and their alternatives' (Brenner et al., 2010, p.184). They point out that while neoliberalisation fosters the processes of marketization and

commodification, it also intensifies the uneven and variegated 'development of regulatory forms across places, territories, and scales' (Brenner et al., 2010, p.184). In this regard, the implementation of the Chinese e-waste formal management system is fertile ground for investigating this dynamic.

CONCLUSION

In this chapter I have entered into the black box of the Chinese e-waste management system. I have focused on the implementation of a formal scheme for certified recycling companies as well as its mechanism of financing. Building on existing literature on the subject, I have suggested that the process of formalising the sector shifts in the direction of neoliberalism, which favours global capital over the interests of local traditional actors operating in the industry. Yet, whilst pushing forward this argument I have suggested that the framework of neoliberalism, while correct, needs to be integrated with analytics from Polanyian economic geography in order to give account of the variegated and uneven dimensions of this change. Therefore, the aim of this chapter has been twofold. First, while it is usually argued in the literature that China has implemented an Extended Producer Responsibility scheme, I have contended that this is not the case. I have argued that the system implemented in China is better understood as a state-funded model, but this is not a matter of mere classification. Instead, I have suggested that this point reveals a particular legal and cultural tradition of the country, and thus, rather than simply describing specific imaginaries of e-waste and environmental management, this outcome uncovers, more interestingly, conceptions of the economy and its regulation.

Second, I have suggested that the institutional design for the e-waste management system is a highly political process. Rather than being a straightforward change, the final outcome represents the result of the confrontation of alternative state projects promoted by different ministries, government agencies, research institutions, the industry, NGOs and other unevenly empowered actors. To describe this process, in this chapter I have focused particularly on a few contrasting positions in governmental bodies and in the industry. These have focused on the process of promoting large-scale operators over traditional informal recyclers as well as on the implementation of a governmental fund, instead of Producer Responsibility Organisations or individual schemes for the financing of certified recycling companies. In both cases, I have shown that different empowered actors participating in the policy design were promoters of alternative 'state projects'. I have thus contended that the final outcome, which favours the establishment of large-scale plants financed through subsides administrated by a governmental fund, is an institutional compromise that regulates diverging pressures produced by forces which are pushing towards a neoliberal adjustment and powers embodied in a resilient *dirigiste* state.

THE POLITICAL SPACE

URBAN POLITICAL ECOLOGIES OF WASTE IN CHINA

CHAPTER 8

'Every day in every context, people acting individually or collectively, produce or reproduce the rules of their society.'

Manuel Castells, *The City and the Grassroots,* (1983, p.xvi)

INTRODUCTION

Sarah Moore suggests that waste can be conceived as separate from society, i.e. as an externality of social processes such as production or consumption, and can also be comprehended as a constitutive and immanent part of our urban environments, i.e. a common resource. These different dimensions are not exclusive, but coexist as unsolvable inner antinomies (Moore, 2008; Žižek, 2006; Žižek, 2004). They emerge through the struggles of people who deal with waste, revealing the conflicting interests between different positions as well as the political potential of this peculiar matter. To examine the dialectical dynamic of contrasting environmental narratives and practices where waste is involved, in this chapter I engage with two strands of academic literature: urban political ecology (Heynen, 2014; Heynen, 2015; Heynen et al., 2006; Keil, 2005; Swyngedouw, 2006; Swyngedouw, 1996; Swyngedouw and Heynen, 2003) and environmental politics focusing on China (Johnson, 2010; Ho, 2007; Yang, 2005; Wu, 2009). In doing so, I seek to contribute to recent debates around the need of broadening

research in urban political ecology (UPE) and contextualising it in different geographical landscapes (Demaria and Schindler, 2015; Lawhon et al., 2014). Therefore, while this chapter situates itself within the Marxist tradition in UPE, it is also inspired by the call of Lawhon et al., (2014) to mingle with more heterogeneous literatures. In accordance with these scholars, I contend, therefore, that this strategy is beneficial for the discipline. It is useful to analyse different urban experiences as well as to highlight heterogeneity in processes of shaping, politicizing and contesting distinct urban environments (Lawhon, et al., 2014). A central tool that I use in this analysis is the concept of metabolism that I briefly introduce in the following paragraph.

Metabolism is a popular notion employed across disciplinary boundaries, and it plays a central role in different domains of knowledge, such as industrial ecology and ecological economics (Demaria and Schindler, 2015). For example, industrial ecology uses this concept as a model for industrial symbiosis (Chertow, 2000; Chertow, 2007) and to implement best practices aimed at tackling environmental challenges (Tong et al., 2004). Inspired by natural metabolic processes, industrial symbiosis promotes the establishment of industrial metabolisms that could transform waste of one industry into energy for another. Therefore, in this literature, metabolism it has been mainly deployed as a normative project (Newell and Cousins, 2015). Urban political ecologies have equally used the concept of metabolism in order to analyse the complex nexus of socio-natural processes, material flows, and spatial structures of cities (Newell and Cousins, 2015), but have also expanded it to include questions of power (Lawhon, et al., 2014). Therefore, UPE literature has investigated the human-environment geography to raise questions about inequality, justice, and poverty, and advocating for more just urban environments (Lawhon, et al., 2014).

UPE conceives material flows therefore as the expression of power relations aimed at domesticating nature, and at (re)producing space and capital (Swyngedouw, 2006). From this standpoint cities are conceived as cyborg constructions (Swyngedouw, 1996), made of human-machine networks and hybrid socio-natural environments (Swyngedouw, 2006), 'full of contradictions, tensions, and conflicts' (Swyngedouw, 1996, p.66). Circulating through spaces of consumption, production, and destruction, flows of waste are a symptomatic example of human-nature interactions and a powerful perspective to analyse social relations as well as specific ideological and environmental narratives that are constructed and mobilised to produce urban environments and impose accumulation regimes. In this regard, China represents an interesting example for studying questions at the nexus between ecology, power, and the urban. Over the last few decades, two interrelated phenomena have strongly characterised the country. These have been the massive urbanisation process, and the overexploitation of nature, increasingly conceived as an accumulation strategy (Smith, 2007; Smith, 2008). This rapid process of urbanisation of nature has been characterised by a serious ecological degradation, which has pushed the country to the edge of an environmental crisis (Shapiro, 2012). What's more, this change, rather than being only an ecological issue, has an important political content (Wu, 2009). Its implications not only involve environmental governance, but could eventually influence the emergence of new institutional forms in the country (Johnson, 2010).

Therefore, in this chapter, I investigate waste in urban China to describe and analyse Chinese politics. Building on Mertha (2009), I contend that in contemporary Beijing a number of 'policy entrepreneurs' (such as independent activists, scholars, officials, NGOs, and journalists) who focus on waste issues operate in the political cleavages of a fragmented policy system, promoting individual and organisational agendas.

Furthermore, following Johnson (2010), I consider that these actors play an important role in fostering participatory forms of decision-making and eventually institutionalising new forms of governance. In outlining these dynamics, I argue that the clash of divergent interests, the sharing of different ideas, and the collaboration in common projects not only have implications in reshaping urban metabolisms and environments, but they also represent political practices, for those involved in these activities, that have far reaching consequences. These processes contribute to reinforcing participatory forms of decision-making at local and national scales, both through direct participation, for instance in environmental impact assessments (Johnson et al., 2015), and also, in my opinion, through an indirect influence that NGOs and individual activists have towards decision makers, by participating for instance in conferences and pilot projects. I thus suggest conceiving waste not only as an environmental issue but also as a micro political space; an arena where different political actors confront each others. I therefore describe and analyse examples representing two different kinds of policy entrepreneurs and the larger networks of people that are in contact with them. I focus first on the activities of a civic environmental NGO, and second on an initiative promoted by a local scholar. In the following section I will also briefly outline the literature on environmental politics in China.

EMBEDDED ENVIRONMENTALISM

Between the end of the 1970s and beginning of the 1980s, research on China mostly produced accounts of the overall status of the environment, focusing on issues such as deforestation, desertification, water, biodiversity and the like (Wu, 2009). While research on environmental governance appeared a decade later (Ross, 1987), environmental

politics was consolidated as an independent field within China studies only in the second half of the nineties (Wu, 2009). Over the last two decades, literature in both English and Chinese has flourished. Wu (2009) observes that three major themes have been largely investigated: the state and environmental governance (Economy, 2011; Edmonds, 1998; Shapiro, 2012); public awareness and social activism (Geall and Hilton, 2013; Wang and He, 2004); and environmental foreign relations (Robinson, 1992). However, two subthemes clearly stand out in this scholarship: the role of environmental nongovernmental organisations (eNGOs), and public participation in the policy process. The growing interest in issues focusing on the role of individuals, organizations, and more broadly civil society, reflected the boom of what Zhan and Tang (2013) call civic environmental NGOs. In fact, from the founding of pioneer organisations such as Friends of Nature (FON) in 1994, the number of eNGOs has exploded over the last decades and these organisations have quickly become key actors in China's environmental scene (Zhan and Tang, 2013).

Different from government organised NGOs (GO-NGOs), student NGOs or international NGOs, civic eNGOs share a number of features that have attracted scholars' attention. They are operated by private citizens, whose leadership plays a central role in fostering their development. They are also grassroots oriented, choose non-confrontational approaches, and usually engage with media and government authorities through a variety of channels (Teets, 2009; Zhan and Tang, 2013). Moreover, as noticed by Yang (2005), while eNGOs still remain subordinated to the political field, the influence between organisations and the state is not unidirectional. While most eNGOs choose to avoid involvement with broader social movements or framing their action in political lexicon, as noticed by Ho (2007) 'inevitably there is a political aspect within each movement' (p.195). Each environmental campaign that involves pollution's victims or

citizens' rights has, in fact, a significant political potential. As a result, a central question that scholars have investigated in the field is to what extent does the action of non-state actors potentially bring a resurgence of civil society (Geall and Hilton, 2013) and, eventually, political change in China (Ho, 2007)?

Some authors have suggested that the emergence of NGOs, environmental initiatives, and the like, is indeed an element of dramatic transformation (Geall and Hilton, 2013; Wu, 2009), because individuals and organisations act, as suggested by Yang (2005), as agents and sites of change. However, other authors have pointed out that the pro-active governmental position towards the environment has closed spaces of confrontation and narrowed the scope of environmental organisations (Wu, 2009). As a result, this second strand of the literature usually has a pessimistic view on the degree of change that environmental initiatives and movements could bring to the society. Somewhere in between these divergent positions, Saich (2000), focusing on bottom-up initiatives, has described the environment as the site of micropolitical actions. This usually refers to projects that are goal-oriented and seek collaboration with official bodies. This approach allows promoters to relate to the government through non-contentious means, and, eventually, to affect the policy-making process (Wu, 2009). Saich (2000) explains this phenomenon of 'negotiating the state', suggesting that these strategies allow individuals and organisations to minimize state penetration and foster members' interests and organisational goals.

Being embedded in a semiauthoritarian political system (Ho, 2007), activists have learnt to operate in a fragmented environment (Mertha, 2009) that has increased space for social action. As correctly pointed out by Johnson et al. (2015) eNGOs and other non-state actors, such as lawyers, journalists, financial institutions, individual activists, and

scholars, have taken advantage of the pluralisation of the policy process and have played, in recent years, more important regulatory roles (van Rooij et al., 2014). In this regard, building on Kingdon (1995), Mertha (2009) defines these actors as 'policy entrepreneurs', who advocate 'for proposal or for the prominence of an idea' and invest their resources to foster policies they approve (Kingdon, 1995, p.122). Mertha (2009) explains that the Chinese fragmented policy system has created political cleavages, which are a fertile ground for fostering specific agendas. According to this scholar, there are three types of policy entrepreneur in contemporary China: officials belonging to agencies and who are critical towards certain policies, journalists and editors, and finally individual activists and NGOs (Mertha, 2009). In this chapter, I contend that waste is a fertile domain for investigating these dynamics. I thus give an account of different figures of policy entrepreneurs and the strategies adopted for achieving their goals. Following Johnson (2010), I argue that in contemporary China, non-state actors in the field of the environment, through a variety of tactics, play a dramatic role in 'consolidating governance reform and promoting new norms that could eventually lead to the institutionalisation of more participatory forms of governance in China' (Johnson, 2010, p.432). Pushing forward this argument, I suggest that this process occurs both through direct participation and indirect influence, and it has important political consequences, i.e. fostering new forms of governance, and material implications, i.e. participating in the co-production of urban environments and metabolisms. I thus suggest conceiving of waste as a political space for flows of materials, movements of people, and circulation of information. To further unpack this idea, in the next section I analyse the action of an extremely active policy entrepreneur in contemporary Beijing: the civic eNGO Nature University.

NATURE UNIVERSITY

Nature University (自然大学) is probably the most active civic NGO focusing on the waste issue in Beijing, and possibly in the whole country. While Nature University acquired the legal status of private non-enterprise entity (民办非企业单位)[59] in April 2009, it was originally founded in 2007 by the journalist Feng Yongfeng (冯永峰). Born in the seventies in the region of Fujian, Feng Yongfeng graduated in the 1990s from the department of Chinese studies of Peking University. After having worked for several years as a journalist for the *Tibet Daily* (西藏日报) and subsequently for the *Guangming Daily* (光明日报), a newspaper based in Beijing, he turned to environmental activism in the middle of the 2000s (Li Zhen, 2014). To grasp the spirit that animated the creation of Nature University, it is useful to quote an interview of its founder published by the Chinese magazine China Youth (Zhao, 2013).

> 'Today I believe that professionalism is a way to escape reality, an amulet to refuse to engage with social issues. Unfortunately, I am a kind of person who loves to get into trouble. Since I was a child, what I really couldn't trust were norms, principles and the like. Each time I encountered some kind of doctrine, inevitably there was a collision. We are all free and common individuals. For what reason should we allow shackles and chains to bind us? In other words, professional capabilities and the like are the easiest to achieve. What is hard to reach is honesty and morality.'

The quote above describes how the motivation that pushed Feng Yongfeng to found Nature University was not only linked to his environmental consciousness, but more interestingly had important moral and political dimensions. The strong emphasis that Feng Yongfen put in the description of the difference in importance between professional capabilities and moral qualities shows how he understands that environment

[59] The Chinese equivalent of non-for-profit organisation, see Jordan, Lisa and Peter Van Tuijl (2006).

issues are not conceived in a technocratic fashion, but have important political and social implications, which are at the origin of his engagement. As the name suggests, a characteristic of Nature University, since its early years, has been the involvement of the public through pedagogic activities. The first activity of the organisation, in 2007, was the 'water urban promenades' (城市乐水行). These consisted of fieldtrips, open to the general public, to different water streams in Beijing. Accompanied by environmental experts, activists of Nature University measured the water quality of Beijing rivers and pursued, through this activity, two aims: one being to monitor the pollution level of water streams and the other being to raise public awareness about environmental issues (Li Zhen, 2014).

In under a decade, Nature University had established its offices in a northern Beijing suburb, developed a website, and employed mobile phone applications to promote its activities. While the number of fixed activists increasing, the NGO also opened new 'thematic courses' such as the 'trash travels' (垃圾之旅). Working on the same principle of the water urban promenades, the trash travels gathered activists and general public to visit informal sites for recycling in Beijing, and to investigate issues relating to waste sorting and recycling. Today, these activities promoted by Nature University are organised in 'institutes' (学院), which are thematic groups of the organisation. Each institute works independently from or in collaboration with other external bodies and focuses on a specific topic. The 'waste institute' (垃圾学院) is a remarkable example. Composed of a small group of activists, it serves as a base to organise activities of the NGO and also as an informal network that links the organisation to a larger group of external people, such as activists focusing on waste in other local NGOs, scholars, journalists, students, individual activists, and so forth. The waste institute reaches hundreds of members through these channels.

Social networking services play a major role in shaping the action of Nature University and of the waste institute. Besides the NGO's website and the activists' accounts on the well-known Weibo platform (微博, literally mini-blog)[60], another crucial tool used by this organisation is the popular Chinese mobile phone application Wechat[61]. Released in 2011, Wechat is a text and voice communication service which enables users to instantly and freely share messages, files, pictures, and videos, through chats composed of two to more than a hundred members[62]. While it is often the case that many NGOs can only secure limited funding to carry out their activities, the potential for social mobilisation and freedom of association of these new means must not be underestimated. These tools have played, for instance, a central role in the recent developments of the anti-incineration campaign of *Asuwei*, which I will present in the following paragraphs. Indeed, the Asuwei case gives interesting insights into understanding the political role that Nature University occupies and which strategies this organisation adopts to foster its goals.

The Asuwei Case

Built in 1994, Asuwei is the largest landfill in Beijing. Situated in the district of Changping, the site was chosen for the construction of a waste incineration facility at the beginning of the 2000s (Johnson, 2013). When residents of a nearby wealthy district learned about the construction plan in August 2009, the Asuwei incinerator quickly became a contested project and the strong anti-incineration campaign raised national attention. Local residents built two websites to exchange information and went to the

[60] A Chinese mini-blogging service, similar to Twitter.
[61] In Chinese *weixin* (微信), literally micromessage. Wechat can be described as being somewhere between WhatsApp and Facebook.
[62] Besides this application, Wechat is also largely used in China to transfer money, download city maps, books and other services.

construction site to display banners to protest against the incinerator project (Johnson, 2013). Johnson (2013) shows that during the early phases of the campaign the attitude of local citizens and activists changed from a simple opposition to the project to a more complex stance, transforming into a collaborative approach with the local authorities. A group composed of activists and local citizens produced a detailed report, which argued against the unsuitable solution of waste incineration and proposed other viable alternatives. Citizen science became a crucial tool (Mao Da, 2013) in framing what Zhang (2014) defines a 'rational resistance'. The activist campaign eventually succeeded in delaying the construction of the incinerator for several years. However, in 2014, Beijing municipality again proposed the construction of the Asuwei incinerator. The 'Asuwei circular economy park'[63] was presented by the Beijing municipal commission of city administration and environment (北京市市政市容管理委员会) in late December 2014 (Beijing TV, 2014). After five environmental impact assessment announcements, a public hearing was finally held on 23 April 2015. Mao Da (毛达), a scholar, activist and cofounder of Nature University was delegated to represent the interests of the local community at the public hearing.

Although this process eventually resulted in an approval of the EIA few days later on 28 April (Caixinwang, 2015), Mao Da (in a personal communication) defined the public hearing as a 'historical event'. In fact, it had been more than 10 years since such a procedure was held in Beijing. The last and only other precedent was the public hearing for the water management project for the old Summer Palace park[64] in 2005 (Renminwang, 2015). Meanwhile, Nature University activists reorganised their strategy. A Wechat group of 84 members composed of activists, local residents, waste management experts, and one foreign scholar (myself), served as a principal vehicle for the

[63] In Chinese 阿苏卫循环经济园区.
[64] In Chinese Yuanmingyuan (圆明园).

organisation of the anti-incineration campaign. Mao Da was invited to a conference in England and got in touch with representatives of the UK Zero Waste alliance as well as local experts. He obtained an assessment carried out by a toxico-pathologist of the University of Ulster showing evidence of the unreliability of models used to estimate potential harm from dioxins emitted by incineration facilities, and planned to sue the Beijing Environmental Protection Bureau (EPB) that had released the environmental impact assessment for the Asuwei project. The proximity of the NGO with local media also guaranteed coverage of the campaign in the press. While it is not possible to predict whether or not the campaign will be successful, these activities have, in any case, an important potential for fostering public participation in the decision-making process and institutionalising new forms of governance. As pointed out by a Chinese environmental activist in a personal communication,

> 'NGOs work at the bottom, on very small issues. If we were not able to see any advances, we wouldn't carry on with this work. However, every single campaign brings a little improvement. Every action is political. We don't say this, but every single action, such as an anti-incineration campaign, is a political action, because it involves citizens' rights.'

Besides the obvious uneven displacement of risks that the construction of the Asuwei incinerator brings to the local population, what is at stake here is something that belongs to the political sphere: the defence of citizens' rights, as pointed in the quote above. While engaging in these kind of initiatives, Nature University plays a clear transformative role not only in contesting particular flows of materials and thus participating in the production of urban metabolisms, but also in contributing to shaping the boundaries of the political space that waste represents. I further outline this point in the following part.

Advocating for Beijing Recyclers

In recent years, Nature University has also been an energetic promoter of the interest of Beijing recyclers and has advocated for policies in favour of these actors. In fact, besides creating public concern for the populations exposed to the social and environmental externalities of these projects, and essentially being 'an uneven displacement of risks to human and environmental health' (Gutberlet, 2012, p.21), the introduction of waste-to-energy technology and other large-scale projects for the recycling, treatment and final disposing of waste, is also increasingly perceived as a threat to the informal economy as pointed out by my informants. While incineration facilities and other technologies such as large-scale recycling plants, are often promoted as an efficient and modern way of dealing with waste management, the choice for these kinds of technology is never neutral. In China as well as in other countries, the adoption of new technologies to modify urban metabolisms (Demaria and Schindler, 2015) has a strong impact on the livelihood of traditional recyclers and can be understood as an enclosure of the waste commons (Gutberlet, 2012; Lane, 2011; Schindler et al., 2012) and therefore a dispossession of a precious means of production of people making a living with waste (Harvey, 2005), as already introduced in previous chapters. Indeed, the entry of new actors into the market inevitably leads to an increasing competition for the control and appropriation of recyclables and eventually to the loss of jobs in the informal economy (Schindler et al., 2012). As explained by one of my informants, the boss of an informal market for the trade of recyclables in Beijing,

> 'though we produce a lot of job opportunities, our government doesn't attach much importance to employment. Calla Rose[65] said that the jobs

[65] Calla Rose Ostrander, Director of Climate Initiatives at the Rathmann Family Foundation and former Climate Action Coordinator for the City of San Francisco. She participated in the 2014 Zero Waste conference in Shanghai, together with the in informant quoted in the text.

> created by waste sorting and recycling are several times the number of jobs created by incinerators and landfills. This industry is atrophying, although more and more people are starting to pay attention to it. Everybody knows that [recycling] is a sunrise industry and would like to invest into it. However, the government, in reality, is squeezing our space.'

There is a reason for the ambivalent attitude of authorities towards Beijing recyclers. While they tolerate the industry, they also acknowledge, according to Lao Wang, the informant quoted above, that it is difficult to control it:

> 'The government in reality thinks that to control all these people is not easy. If there is nothing bad that happens, then they still tolerate us. However, when there is an accident it just becomes very difficult to manage it. […] So, they would prefer, more safely, that we stop doing this activity.'

In fact, while large-scale technology, such as incinerators and big recycling complexes, is considered a viable and safe solution to deal with waste management and is therefore in line with the image of a 'world-city' and modern country, this is not the case for traditional methods of recycling. Although tolerated and even promoted in recent years (DocuChina, 2012) as both a way to foster local development and address poverty reduction, these activities are no longer consistent with official narratives that promote modernisation and technological advancement (Lora-Wainwright, 2016). As a result, informal recycling simply has no place of its own in modern urban planning (Schindler et al., 2012; Tao et al., 2014). The dark irony of this situation is that while being stigmatised, these activities provide a fundamental service, which in other countries is often a burden for society, as clearly pointed out by Lao Wang:

> 'In foreign countries, waste recycling is a service and it must be financed by taxes. Indeed, we don't ask for any government subsidy. We only ask to find a piece of land to carry out our activities. We will cover the costs with the profits from our work.'

As we have seen in previous chapters, as markets for recyclable waste are recurrently subjected to demolitions, it becomes more and more difficult for Beijing recyclers to find new locations to carry out their activities. After the urban redevelopment project of Dongxiaokou brought about the demolition of waste markets in the area, Lao Wang could not find a place to relocate his activities, which had given work to hundreds of people, from employees to subcontractors. In fact, when early rumours of demolition spread several years ago, Lao Wang started to look for a site where he could relocate his market to and invest in upgrading his infrastructure and technology, and he quickly identified such a site in Xiaotangshan (小汤山)[66]. However, at the time of my fieldwork, this project had not yet started, as described by my informant:

> 'The project of Xiaotangshan concerns some wasteland outside the rural village. The biggest problem is that it is not possible to build there. I mean, we don't have the land use permit, the construction licence, the planning licence… in total we need 5 certificates. Construction is just forbidden.'

While administrative obstacles have blocked the creation of the new market, the root of the problem is a political one. As Lao Wang clearly explains:

> 'The government maybe hopes to drive out the low-end industry (低端产业)[67] through economic measures. For instance, distribution markets and the like. Dongxiakou is a kind of waste distribution market. That's why we would like to transform and upgrade our industry. We proposed many ideas: circular economy (循环经济), industrial recycling (静脉产业)[68], urban mining (城市矿产)… however, the government doesn't listen to us, even if they do understand.'

In recent years, Nature University has been very active in advocating the rights of actors working in the informal economy, and particularly of Lao Wang's family. One way of

[66] Small town in northern Beijing suburbs.
[67] Here the term refers to informal and precarious activities beyond the domain of waste recycling.
[68] Literally, 'venous industry'.

promoting Lao Wang's interest has been to invite him to conferences and workshops to present his project. For instance, in December 2014, Lao Wang spoke at the China's Zero Waste annual conference[69].

Figure 1. Lao Wang at the 2014 Zero Waste conference in Shanghai



Organised in Shanghai, the conference gathered a large number of actors such as representatives of social enterprises, local and national officials, activists, scholars, and so forth. International figures of the Zero Waste movement such as Rossano Ercolini[70], Prof Paul Connett[71] as well as foreign experts from cities adopting the Zero Waste strategy such as Calla Rose Ostrander and Jonh Macy from San Francisco, joined the conference. Here, Mao Da, from Nature University, presented a report focusing on China's national renewable energy policy, and argued for a reform of the subsidy system, which favours waste-to-energy technology[72]. Lao Wang presented the project for

[69] Originally initiated in Europe and United States, Zero Waste was born as an anti-incineration movement, advocating for an alternative and more sustainable waste management approach.
[70] The president of Zero Waste Europe, awarded the Goldman Prize in 2013.
[71] A well-known anti-incineration campaigner and historical figure of the American Zero Waste movement.
[72] Today in China, incinerators are subsidised for every kilowatt of electricity produced and put into the national grid. There is therefore an important economic incentive for this technology and more sustainable

upgrading his waste market as well as other propositions to improve the current informal system for waste recycling in Beijing. A few days later, Nature University organised a workshop in Beijing and invited two of the foreign experts who spoke in Shanghai, Lao Wang, and a number of Beijing local officials (one of these was a member of the Beijing Municipal Commission of City Administration and Environment) to join the discussion. Lao Wang once more presented his project to a full room.

Through these activities, Nature University gives voice to actors that are usually ignored and tries in this way to influence policy makers. The direct impact of this effort is difficult to gauge. However, these practices show that waste represents a particular space in Chinese society where a certain degree of political participation exists. This occurs not only through formal channels such as environmental impact assessments (Johnson, 2013; Johnson et al., 2015), but also through a wide set of informal exchanges in conferences and social media, as I will show in the following paragraphs. A few months after the conference in Shanghai in early 2015, the Ministry of Commerce together with four other national bodies[73] issued a new policy (Mofcom, 2015) aimed at formalising current actors working in the industry. Nature University once again invested time and resources to help Lao Wang. The activist gathered 14 people close to the association such as officials, scholars, and students in order to help Lao Wang in applying for the formalisation of his company. The main channel used to share information between these people, some of them living in different cities in China, was the already cited mobile phone application Wechat. Interestingly, one member of the group was also one of the initiators of the *Hongfuyuan Environment Protection* project, which I present in the following section of the chapter. For several reasons, this actor represents a different policy entrepreneur's

practices of prevention, reuse and recycling of waste are affected by an uneven competition, see for instance Mao Da (2014).

[73] National development and reform commission, Ministry of land and resources, Ministry of housing and urban-rural development, All China federation of supply and marketing cooperatives.

rationale. Moreover, another member of the group was a very well known Chinese scholar close to national bodies such as the National Development and Reform Commission (NDRC). This second scholar has been involved in the design of several national policies and projects in the domain of waste recycling and represents another figure of policy entrepreneur of this variegated political arena. In a personal communication, this scholar expressed a critical position towards a number of governmental policies. The scholar represents therefore a bridge between NGOs and the official bodies. This proximity displays an indirect avenue through which elements of change can be integrated in the policy-making process. As Gutberlet (2012, p.28) correctly pointed out, 'a key issue is how decisions are made and to what degree civil society is involved in the decision-making processes'. Here, it is difficult to say what the direct impact of Nature University on the decision-making process will be, and whether Lao Wang will finally succeed in formalising his company. However, I believe that through a wide range of non-contentious tactics such as tying alliances with local communities, informal entrepreneurs as well as with officials and scholars, this organisation plays a dramatic political role. This not only occurs when the NGO operates through official channels, such as participating and contesting environmental impact assessments or providing legal support to pollution victims (Johnson, 2013; Johnson et al., 2015), but also in my opinion through a wide range of informal channels that delimitate the political space of waste. These include conferences, social media and the like. In the following section, I will describe and analyse the role of another actor that participates in this political process.

HONGFUYUAN ENVIRONMENT PROTECTION

In the first section, I analyse the action of a civic eNGO. In this second part of the chapter I tell the story of a different kind of policy entrepreneur: scholars. While many points of contact exist between activists and scholars, I shall argue that the two groups occupy a different political space. The close proximity between scholars and officials, both at the local and the national scale, pushes these actors to adopt different strategies to influence public policy. These strategies involve the formation of strong alliances between a variety of official and non-official actors. In the following pages, I therefore describe and analyse an alliance between scholars, national officials, entrepreneurs, and a local administration, which was aimed at implementing a specific public policy at the local scale and eventually influencing policy design at the national level. In doing so, I give account of the *Hongfuyuan Environment Protection*, a community oriented pilot project in the northern suburbs of Beijing, which I followed since its early planning meetings in autumn 2013 until its implementation in 2014. The objectives of the project were to address waste production in the community and to collect end-of-life mobile phones for recycling through official channels.

Background of the Project

The Hongfuyuan project was implemented in a residential community of Zhenggezhuang, a village in the northern suburb of Beijing, located between the fifth and the sixth ring road. The area is twenty kilometres away from the capital city centre and six kilometres away from the nearest metro station. Formally a rural village, Zhenggezhuang covers an area of almost three square kilometres. In 1995, a master plan

was realised by the local administration, which eventually started to be implemented three years later in 1998 (Duan Shujun, 2012). Following the implementation of the master plan, the small village that originally had around 1500 inhabitants, was transformed into a satellite town of Beijing of more than 35000 citizens in just a few years. Moreover, in 1996, local administrators re-founded the Hongfu Jituan (宏福集团), a collective company originally created in 1986 and collectively owned by local villagers, in order to manage capital resources and undertake a new path of development for the community. Consisting of a board of directors of local officials, whose president is also the chairman of the village committee, the Hongfu Jituan is the centre of a larger business group, which connects twenty-three subsidiary companies (personal communication).

On the one hand, it is possible to recognise a clear entrepreneurial approach to urban governance in the local leadership and, as a consequence, many elements that characterise the process of rapid urbanisation in China. On the other hand, this model of urban management reflects the idea of the village as a collective corporation and, consequently, it echoes the idea of city-making as a 'product and condition of on-going social processes […] of capitalist development' (Harvey, 1989, p.16). This mix of entrepreneurial style and management of the city as a collective corporation are elements that strongly characterise the identity of the village. Its unquestionable success in the inter-urban/rural competition made Zhenggezhuang a development model, which is described as a success story in official narratives and in the press[74]. In my opinion these conditions made the establishment of a pilot project in the village an easier task. In fact, the idea of a modern collection system for waste management somehow matched the image that the local administration wanted to promote for the community.

[74] See for instance Duan Shujun, [accessed 30th May 2014].

Before the *Hongfuyuan Environment Protection* pilot project started in December 2013, the Hongfuyuan Sanitation Company (宏福环卫公司), a subsidiary of Hongfu Jituan, was already running the daily waste management activities in Zhenggezhuang. Hongfuyuan Sanitation Company has been doing this for several years. Besides its employees, the company subcontracted some of the activities to eight independent collectors, as well as to a small team in charge of logistics and a nearby waste-sorting centre. Independent collectors paid an annual fee to the Hongfu Jituan to acquire the right to collect and trade waste inside the village. They usually purchased recyclable materials from local residents. Door-to-door, they collected packaging, plastic bottles, household appliances, and the like. Subsequently, they sold these materials to nearby informal markets. Here, waste products were usually sorted, sometimes treated, and then resold to recycling companies or intermediaries, re-entering the economic cycles as described in previous chapters. Finally, the small logistic team employed by the Hongfu Jituan was mainly in charge of transporting domestic solid waste, discarded in residential garbage bins, to a sorting centre in order to recover further recyclable materials not previously collected. The sorting centre employed one worker, who received a monthly salary. The worker could also use a lodge for himself and his family and had the possibility of appropriating profits from the trade of recovered recyclable materials. Unrecyclable waste was finally transported to a nearby landfill, which charges a fee for the service according to the weight of waste to be treated.

The Pilot Project

A scholar from a well-known Chinese university initiated the Hongfuyuan project. This was a social experiment aimed at testing possible policy interventions in the domain of waste sorting and recycling at communal level. Thanks to personal relationships with government officials, the scholar formed a small group based on previous collaborations, with one expert from the China Household Electric Appliance Research Institute (CHEARI) and one official from the Ministry of Industry and Information Technology (MIIT), in order to work on a plan for the establishment of a pilot project. A first draft was prepared in May, 2013. The initial project aimed at establishing a recycling system in ten pilot neighbourhoods in central Beijing. However, a number of problems, mainly connected with the establishment of an IT platform for the management of the system, arose and slowed down the implementation of the project, which was finally abandoned in summer 2013. In autumn, however, the group got in contact with a start-up company from Sichuan. The company had run a number of successful projects over the past years in other cities. A representative from the start-up was thus invited to join the group to provide a mature IT-solution for the establishment of the project. In November, the project scope was narrowed down to one particular neighbourhood in Zhenggezhuang. This location was chosen because the representative from the Chinese university, thanks to previous collaborations, was already in contact with local authorities. Preliminary meetings were held in November 2013, followed by an official meeting on 9 December. Village authorities, managers of the Hongfu Jituan, representatives from the Chinese university, the start-up, and representatives from CHEARI and MIIT all took part in the meeting. Local officials provided permission and support to the establishment of the pilot project. The project was finally launched on 21 December 2013. Besides

Zhenggezhuan village and the Hongfu Jituan, the project included ten other organisations:

- Three organisers: the Chinese university, the start-up, and the Beijing Economic Law Society.
- Two partners: China Electronic Energy-Saving Technology Association and China Battery Industry Association.
- Five supporters: Formal recycling companies.

The project aimed at collecting five kinds of recyclable waste products: paper, plastics, metals, glass and mobile phones. In the first phase of the implementation of the project, a semi-formal actor and a local youth organisation also joined the project. The project was aimed at conducting a social experiment to investigate the effects of policy intervention in the domain of waste sorting and recycling. In an informal conversation, one of the initiators of the project explained the rationale of the project, arguing that a number of informal practices of recycling have a high environmental impact. As a result, according to this actor, there was a need to foster technologies that could improve the environmental impact of recycling and move from a market relationship to a service relationship between consumers and recyclers. Another initiator of the project stated that 'consumers have to understand that there is a cost for recycling'. An initial promotional activity was thus carried out in the central square of the community on 21 and 22 December. Volunteers from the Chinese university, employees from the start-up, officials from Zhenggezhuang and Hongfu Jituan as well as national officials from CHEARI and MIIT took part in it. More than 100 households registered for the project on the first weekend. Volunteers provided these households information on the initiative and gave each one a subscription card, free bags, QR code stickers for waste sorting, and informational flyers.

One waste bin was placed in one of the village's residential neighbourhoods. From the beginning of March 2014, however, five supplementary recycling waste bins were placed in five different residential communities in the village. Volunteers from the Chinese university carried out activities on weekends to introduce the project to residents and to invite them to join the pilot project. Every resident who had already joined the project was also informed of the place and time of further activities and was provided support. By the end of the month, the number of registered households had risen to 500. At the beginning of the project, one of the eight local collectors decided to join the experiment. The agreement defined that while he could collect recyclable waste discarded in the bins, resell it to local informal markets and keep the profit, he had to deliver mobile phones to the formal companies that joined the project. In addition to the profit from the selling of the waste materials the local collector also received a fixed monthly salary. Members from a local student organisation, the Hongfuyuan Youth Society, also joined the project at this stage. They provided assistance during the informational campaigns and helped the person in charge of the IT-platform. A hundred days after the implementation of the pilot project, on 30 March, a final activity was organised in the community.

Throughout the entire implementation of the project, the principal and most engaged member was the scholar, who originally had the idea of initiating the pilot project, as was acknowledged by all the other members. The second most engaged partner, to my knowledge, was the representative from the start-up company from Sichuan. However, it can easily be understood that the motivations for joining the experiment were different for the two partners. While the motivations for the first actor were connected to the possibility of actively participating in the policy-making process, the start-up company joined the project pursuing a financial goal to be realised in the longer run. While the two representatives from a research institute and a governmental body, CHEARI and MIIT

were actively engaged in the design and initial implementation of the project, as well as in the official meetings with local authorities, their participation in the further phases of the project was rare. However, the representative from MIIT, following the experience of the *Hongfuyuan* project, submitted a report to superiors in the ministry, with the intent to influence policy design inside the organization. The five supporters (the formal recycling companies) neither took part in any official nor informal meetings and activities I attended. In a personal communication, one of the informants acknowledged that the involvement of the formal recycling companies was due to the representative from MIIT, who introduced the initiative to the five enterprises and proposed them to join the project as supporters. Finally, the individual collector who had joined the project positively assessed the partnership and estimated that this brought a number of improvements to his daily work and material conditions. When asked why he decided to join, he acknowledged that the initiative 'had advantages for both [him] and other partners of the project'. As one of the members of the project recognised, the contribution of the local collector was essential for the development of the initiative, because in order 'to achieve these kind of projects, we have to find a way to let local collectors make profits'. However, while the material conditions of the local collector improved, the project clearly increased the competition with other local collectors that did not take part in the initiative, because, as a Beijing environmental activist critical towards this kind of approach pointed out, 'these kinds of projects tend to establish a monopoly and push out traditional recyclers'. In fact, while the individual collector who joined the project acknowledged that the policy resulted in a number of personal benefits, he also recognised that the introduction of this new technology represented a social threat. He shared his concerns in a personal communication that 'in few years this system will replace all of us'.

In fact, similar initiatives have appeared in many Chinese cities in recent years. Examples can be easily found in places such as Beijing, Shanghai, Wuhan, Guangzhou and Chengdu. These projects usually involve a variety of actors such as social enterprises, local administrations, universities, schools, NGOs, and sometimes, informal recyclers. The main objective is typically to address consumer behaviour and reduce waste production through the establishment of waste collection systems in residential areas. While the rationale behind these projects is often a genuine concern for the environment and health of workers in the industry, the entry of new economic actors, such as social enterprises and in particular formal recycling companies, eventually results in increased competition for informal recyclers already established in a given territory. This conflict of interests is therefore reflected in the divergent perspectives of promoters and opponents of these projects. Promoters usually conceive waste as a common resource of society as a whole, and thus justify the presence of competing technologies and in some cases the enclosure of waste as the best way to preserve a valuable commons (Harvey, 2011, p.102). They foster, therefore, the establishment of a system that could reduce waste production and environmental impact, as well as maximise the recovery of recyclable materials. In contrast, the opponents highlight how these projects, substituting a system already in place, promote the interest of a new class of entrepreneurs at the expense of traditional recyclers. From this perspective, the introduction of a new technology is conceived as a dispossession (Harvey, 2005; Schindler, et al., 2012).

CONCLUSION

During the first half of the nineteenth century, the British parliament passed a series of acts called the Factory Acts. The Factory Acts were designed to regulate a number of

issues such as the length of the working day, which was reduced to ten hours, the age of the workers employed in factories, as well as material conditions in working spaces. For instance, new requirements for ventilation and sanitation were imposed on manufacturers. The Factory Acts were, in fact, a direct consequence of the degradation that the industrial revolution had brought to life and labour (Engels, [1845] 1987), and in this sense were meant to improve the material conditions of the working class: a noble cause, indeed. However, their implementation eventually also brought about an unpleasant corollary. They improved the overall condition of the working class, 'yet at the same time, because they [made] it necessary to lay out a greater amount of capital, they [hastened] the decline of the small masters, and the concentration of capital' (Marx, [1867] 1976, p.607).

The historical anecdote above describes how the transition to new technologies and the implementation of policies that are supposed to solve social and ecological issues, inevitably brings about political consequences (Robbins, [2004] 2012). This is unquestionably true in China, where a national official describes the political potential of waste in the following terms:

> 'In China, there are two societies, one is relatively rich, another is relatively poor. Therefore, [the authorities] don't care too much for [the informal recyclers], they leave them collect what they want. This is the main reason why there is no change in the second-hand market. The government accepts things tacitly. They fear that if they snatch this activity from the scavengers, then a bigger problem could arise. They really could lead a revolt, ah ah! This is very dangerous. And if this happens, well, the society just couldn't rely on these people to maintain stability.'

This dramatic account highlights how circuits of waste in contemporary China, rather than simply (re)constructing the urban metabolism of cities, also have a powerful

political potential in shaping politics beyond the domain of environmental governance. To engage with this theme in this chapter, I have drawn urban political ecology literature into conversation with environmental politics on China and have pushed forward recent debates in the discipline. I have argued, building on Mertha (2009) and Johnson (2010), that actors such as NGOs, individual activists and scholars operate in a fragmented political system that has promoted a certain degree of regulatory pluralism. Fostering this analysis, I have suggested that this occurs both through direct participation and indirect influence and I have therefore considered waste as a material and political space of action, the locus where different subjects confront each others and act as agents of change. The examples analysed therefore give account of different policy entrepreneurs, such as independent activists, scholars, officials, and NGOs, who have learnt to move through the political cleavages of a fragmented policy system, and who take advantage of this capability to promote, through their agency, specific goals. While these practices will not necessarily bring substantial changes at present, they will hopefully foster more participatory forms of decision-making in the future and contribute to institutionalising new forms of governance in the longer run.

CONCLUSION

'Money isn't like a car that can sit idle in a garage. It's like a horse that has to eat every day.'[75]

Edoardo Nottola in *Hands over the City* (1963)

In their work *The end of capitalism (as we knew it)*, Gibson-Graham (2006) point out that while it seems problematic, today, to define the United States as a heterosexual or Christian nation, it is not surprising to anyone, rather it is often considered accurate, to say that this country is a capitalist economy. However, the scholars suggest that processes of exploitation and uneven redistribution take place in the very different spaces where work is performed, such as schools, churches, communal or collective enterprises, the household, and so forth (Gibson-Graham, 2006). Why, thus, is the economy usually described as unified? Gibson-Graham suggest that the answer to this question can be found in the history of Marxist literature. Marxists have unveiled the invisible 'monster' of capitalism, but they have put in its place a visible and naked giant that makes any transformative project of society unachievable. They suggest that when capitalism is described as a pervasive entity, diversity is masked and any constructive initiative can only take the shape of a mass movement (Gibson-Graham, 2006). This enterprise appears, however, unrealistic in a contemporary world, where the dialectic of classes has intricate and multifaceted forms. What then shall we do with the monster we have created? 'Should we refine it, cut it down to size, render it once again acceptable, unremarkable, invisibly visible?' (Gibson-Graham, 2006, p.10). Or can we instead image

[75] 'Il denaro non è un'automobile, che la tieni ferma in un garage: è come un cavallo, deve mangiare tutti i giorni.' Rosi, Francesco ([1963] 2006).

a theory of economic diversity? In other words, 'why can't the economy be fragmented too?' (Gibson-Graham, 2006, p.263). The goal of my thesis has been to engage with these questions. In doing so, I adopted a methodology that owes much to feminist economic geography, but a theoretical framework that has its roots in the literature on variegated capitalism (Peck and Theodore, 2007). My effort has been, therefore, to contribute to the investigation of the political economy of capitalism, analysing the diversity and variegation of modes of production, through my empirical study of waste in China. I have suggested that the multiple dimensions of waste, as hazard and commodity, as value and discard, represent a potent tool to look into the political and economic mechanisms of capitalism and are a productive lens to investigate the heterogeneity and variegation of contemporary modes of production.

VARIEGATED SPACES OF WASTE AND VALUE

While dialoguing with literature on the informal economy and engaging with debates on the relationship between formality and informality, I have shown that recycling activities reveal how the economy in China, rather than being a homogeneous and static system, is characterised by a great deal of diversity. This heterogeneity appears as soon as we move our investigation across scales. In this regard, in my first empirical chapter 'Variegated Recycling: Power, Place and Materiality of Waste' I have examined informal networks of waste recyclers in China and I have described and analysed in particular the two 'waste markets' of Dongxiaokou and Xiejia in Beijing, as well as the larger socioeconomic system they are embedded in. I have demonstrated that their organisation of production has much to share with the concept of industrial district. Yet, the informal economy of recycling has a number of characteristics that make this particular system different from

classical definitions of agglomeration economies. I have thus defined this economy as a *Local Informal System*. I have then mobilised the metaphor of *invisibility* to construct the concept of Local Informal System. Further, I have shown that economies of recycling in Beijing are embedded in noneconomic factors such as kinship relationships, informal rules, and cultural norms, which play a major role in shaping the territorial division of labour, promoting both dynamics of competition and collaboration between people and places. These dimensions represent important intrinsic and contingent values of waste and recycling that coordinate the action of a community and result in a number of external economies and 'relational assets'. In analysing these mechanisms, my aim has been to contribute to debates on 'ongoingness' and linearity in economic activity and to demonstrate that the commodification and appropriation of waste in different geoinstitutional contexts brings about the emergence of alternative capitalist mechanisms. I believe that this has pushed forward not only our knowledge on urban China, but also our understanding of contemporary capitalism, combining a networked perspective with a territorial understanding of economic systems (Coe and Hess, 2013), and providing a theoretical framework, the Local Informal System, useful in analysing place-based informal economies.

Furthermore, this work has also been concerned with the question of how informal economies coexist with different circuits of capital. Building on Jessop (2014), this research has understood local economies not as existing in a void space but as co-evolving in a world market and being affected by the uneven impact of other circuits of capital. In order to give account of this dynamic, I have mobilised the concept of ecological dominance (Jessop, 2014). In a given spatio-temporal framework, the capacity of different empowered actors in imposing specific patterns of valorisation, appropriation, and dispossession results in the uneven impact of a variety of capitalism

on other regimes of accumulation (Jessop, 2014). In this regard, I have suggested that informal recycling in Beijing is affected by at least two different kinds of circuits of capital, which in turn result in two different processes of dispossession. First, urban redevelopment projects, and the circuits of capital associated with them, have resulted in the recurrent demolitions and relocations of spaces where informal activities of recycling are carried out. While analysing this process, I have shown that this phenomenon, acting as a process of creative destruction, has stimulated the evolution of the economic organisation of informal recycling in Beijing, accelerating processes of concentration and centralisation of capital in the community of recyclers. While official urbanisation has recurrently dispossessed recyclers of land, this phenomenon can be considered, however, as a process *compossible* (Jessop, 2014) with informal recycling. Second, I have demonstrated that a different process of dispossession is associated with the introduction of regulations and technologies that foster the passage to a formal management system for the recycling of discards. This change is characterised by the definitive enclosure of the waste commons. These findings have important theoretical implications. First, they push forward our understanding of the relationship between informality and dispossession and solve a persistent tension existing in the literature. While research has demonstrated that formal and informal economies are strictly linked and contribute to the overall economy, it has failed to conceptualise theoretically this relationship and move beyond the formal-informal divide. I have suggested that a productive device to aid in an exit from this impasse is to understand formal and informal linkages as the relationship between different circuits of capital. Consequently, processes of dispossession represent the result of the uneven impact of these forces. What's more, a corollary of this first argument is that dispossession also comes in variegated forms. In this regard, while some processes of dispossession are *compossible*, i.e. recurrent but not definitive, others are not. It is these non-*compossible* phenomena that foster the passage to

new social relations of production and they are therefore similar to the original process of primitive accumulation. These metamorphoses, however, are not considered in this work as mechanical and automated outcomes, but as the result of political and economic strategies of different empowered actors (Jessop, 2014). This consideration, therefore, brought me to examine in more detail the role of individual and collective agency.

VARIEGATED SPACES OF INVISIBILITY AND AGENCY

Following from the line of argument above, in the last three empirical chapters of the thesis I have examined the question of agency and the politics around waste. In particular, in Chapter 6, 'Geographies of Invisibility: Livelihood Strategies, Informal Labour, and Worker Agency' I have engaged with debates in labour geography and contributed to this literature through an empirical account of everyday practices of informal workers. I have suggested that while many feminist scholars have investigated the relationship between the spheres of production and reproduction, few studies have investigated labour agency within the informal economy. I have thus pointed out that the study of informal labour can contribute both empirically and theoretically to shedding light on the question of how labour agency contributes to shaping the economic geography of capitalism. Practices of informality are often a conscious strategy to drop out of capitalist social relations and enter into reciprocal exchanges. Therefore, in some cases, they represent ways to rework and resist oppressive circumstances dictated by capital. I have thus given account of the everyday practices and livelihood strategies of informal recyclers in Beijing and demonstrated that these actions are motivated by the aspiration of workers to regain control over their labour time and to produce different dimensions of living and livelihoods (De Angelis, 2007). To understand the individual

and collective agency of Beijing informal recyclers, I have thus mobilised the metaphor of invisibility and constructed this concept by building on feminist labour geography as well as Marxist literatures. I have suggested that invisibility is both a process that brings about the uneven access to resources and labour for subaltern groups as well as a conscious strategy that informal workers adopt to reach specific goals and to improve their material means. Invisibility fosters and constrains workers' actions. This concept is therefore a potent theoretical device and a useful empirical tool to understand labour agency across space and time.

The question of agency has been investigated further in the subsequent chapter focusing on the 'Variegated Geographies of Electronic Waste', where I have made two major shifts. First, while in the previous chapters I have largely engaged with the issue of informality, in this part I have analysed the politics surrounding the establishment of a formal management system for the recycling of electronic waste. I have focused, therefore, on official governance. Second, while in previous sections I have adopted a territorial perspective, in Chapter 7 I have adopted a sectorial perspective, investigating e-waste. The changing of domain and perspective has thus been useful in showing how the economy in China is fragmented and performed by different actors that foster alternative economic and political agendas. In this chapter I have also made a comparison with the implementation of WEEE directives in Europe and challenged a number of assumptions in the e-waste literature. In particular, I have contended that while the implementation of a formal management system for electronic discards in China is often described as a shift towards a style of neoliberal governance, a close reading of legislation and a detailed analysis of the politics surrounding this process reveals a more complex dynamic. I have thus argued that the implementation of reforms in the e-waste recycling sector has to be understood as a process embedded in a local geoinstitutional context. Furthermore, I

have demonstrated that, rather than being a straightforward process, the implementation of the e-waste formal management system is the result of a complex political struggle. I have given account of the politics around the implementation of the system through examples of the actions of different organisations that foster competing economic agendas and promote alternative state projects. Finally, I have suggested that this process has resulted in an institutional compromise between forces promoting a shift towards neoliberal governance and powers of a resilient *dirigiste* state. Pushing forward the analysis of the politics surrounding the management of waste, in the last empirical chapter of this thesis, I have looked into the action of environmental NGOs and other activist groups that participate in the politics around the management of waste in China. Here, I have engaged with literature on urban political ecology and environmental politics in China and I have shown that waste represents not only an object of management but also the material and abstract space for political struggle. In China, a number of different actors engage in the debate regarding the management of waste. They form diverse alliances, move into the cleavages of a fragmented political system, and promote individual and collective goals. In doing so, they contribute to co-producing urban metabolisms and environments and reinforcing participatory forms of decision-making at local and national scales.

MAJOR CONTRIBUTIONS AND FUTURE RESEARCH

Not everything we have in mind can be done in the space and time of one thesis. Something, however, can be achieved. I believe that this work, besides the significance to the specific literatures described above, has at least three main theoretical contributions that are relevant to a larger community and advance our knowledge in economic

geography. First, with the investigation of informal recycling economies in China, this work has explored the diversity of market formations in a real world setting. It assesses that the economy in China is far from being a homogeneous and united entity; rather its study needs to take into account the uneven and variegated nature of capitalism. This finding strongly supports the research agenda of variegated capitalism and indicates a number of important avenues for future investigation. In particular, the thesis has suggested that literature on variegated capitalism needs to take informality and invisibility more seriously. While the variegated capitalism agenda has become an influential field of research in geography in recent years, this project has been surprisingly silent regarding the role of the informal economy. As I have shown in this work, informality is often the space where different organisations of production appear, where workers find ways of resisting and reworking capitalist oppressive relations and contribute to constructing the economic geography of capitalism in diverse and variegated ways. Therefore, I strongly believe that the study of informality can powerfully contribute to the variegated capitalism agenda and it should be taken seriously into account for its potential in describing and analysing economic life in the real world as well as for its value in developing 'trading zones' with other fields of heterodox economic thinking.

Second, this thesis provides a number of major insights into the construction of a theoretical framework aimed at analysing informality in relation to other key themes in economic geography. In particular, it aims at integrating informality into Global Production Networks. While some studies have already mobilised the GPN framework to analyse informal economies, I believe that this work is still scattered and incoherent. I think that a larger and more collective effort has to be made in order to theorise informality in relation to GPNs in a more attentive manner. This point has important implications for the understanding of how local informal and formal economies couple

with GPN, as well as for enriching the framework conceptually. In other words, I propose the design of a research agenda, as it has been done, in recent years, for other branches of the discipline, such as labour and financial geography (Coe and Hess, 2013; Coe et al., 2014). I thus suggest that a brick of this edifice could be the concept of Local Informal System that I have first sketched in this thesis.

Third, my work has also largely engaged with the idea of invisibility, which I have defined as a socioeconomic process and a relational concept. While the metaphor of invisibility has been already mobilised in previous studies, a systematic study of how this concept is understood in different geographical literatures has not yet been realised. While invisibility is a metaphor largely adopted in the literature, it is often used in a vague manner and without positioning the notion in a clear theoretical context. I believe that this is a major absence in geography and that a deeper engagement with invisibility is needed. This project would be useful in bridging together specific strands of economic and cultural geography, greatly contributing to the advancement of our knowledge in the discipline. I think that these research avenues can also be complemented through the adoption of other methodologies used in geography, and can scrutinise further the theoretical and empirical implications of the tools proposed in this thesis. It is my aspiration to contribute towards exploring some of these territories in future years.

I believe that these commitments outline my effort to engage in a dialogue with different strands of scholarship in geography and neighbouring disciplines. As described by Jamie Peck in a well-known paper published in 2012 in which economic geography is portrayed through the iconic image of the island, remarkable differences characterise economic geography vis-à-vis orthodox economics (Peck, 2012). Economic geography finds its foundational elements in theoretical pluralism, cultural institutionalism, methodological

eclecticism, rich grounded explanations, and open theorising (Peck, 2012). In contrast, theoretical monism, market centrism, methodological individualism, parsimonious reasoning, and close modelling characterise orthodox economics. '[T]he ontological and epistemological foundations of the kinds of economic geography practised on the island lately remain orthogonally (if not antagonistically) positioned relative to those of orthodox economics' (Peck, 2012, p.120).

This island life has enabled the discipline to experience a proliferation of indigenous cultures. Today, economic geography is a diverse and rich field, where a wide range of theoretical and methodological approaches flourish, and where scholars have investigated a great variety of topical interests (Clare and Siemiatycki, 2014). Geographers have debated to what extent this plurality of approaches, methods, and interests represents a weakness or strength of the discipline. Economic geography seams indeed caught in divergent tendencies that stretch the field between the opposite poles of fragmented and engaged pluralisms (Barnes and Sheppard, 2010). Nevertheless, scholars have also argued that this commitment to pluralism has transformed economic geography into a productive space for the proliferation of innovative knowledge that is particularly well situated to engage in a dialogue with other heterodox literatures (Peck, 2012). Some of our local varieties have the potential to develop *kula* exchanges with other cultures in the archipelago of economic thinking such as heterodox strands of sociology, anthropology and political economy (Peck, 2012).

With this in mind, I believe that my thesis has tried to make the case, empirically and theoretically, for an engaged pluralism. From this effort, I believe that I have learnt two main lessons that go beyond the content of this work. The first one pertains to the analytical object of the kind of economic geography I practice. The second concerns my

theoretical and methodological commitments. Practices at the boundary between formality and informality, and legality and illegality, as well as elements such as crime and corruption, family and kinship, and culture and language among others are constitutive elements of the economies examined in this thesis. I define this range of diverse factors as invisible elements. Invisible elements are usually absent from the economic analysis of orthodox literatures that are loyal to the theological assumption of the single rationality. However, in the variegated geographies of the real world, these invisible elements represent the everyday life of the majority (if not the totality) of economic actors. The economy is always happening somewhere and somehow. It is situated in geographical and cultural spaces, embedded in social relations, and performed by embodied actors in specific time-spaces. I thus believe that one of the main tasks of geography is to bring to light these invisible elements; to problematize the economy as inherently connected to contingent dimensions; to describe and analyse how time and space influence human activities; and vice versa how human activities shape time-spaces in variegated ways.

As suggested by Doreen Massey, geographical analysis needs to understand that 'history and geography have to be made' (Massey, [1984] 1995, p.304). Therefore, our notion of the economy has to be fluid and geographers need to apply their ability to zoom in and zoom out across scales in order to analyse capitalist formations and to deliver distinctive analyses of structural processes. 'In short, seeking to theorise the complex historical geographies of capitalist social formations necessitates serious consideration of human agency and practices, individual and collective, in the making of those geographies. However, people make such geographies within parameters set by the structural characteristics of capitalist societies and the limits they impose on individual and collective action.' (Hudson, 2004, p.418-419).

To recognise the economy as variegated brings me to the second lesson that I have learnt during my doctorate. This is the importance of taking seriously the theoretical and methodological commitment to plurality in order to produce innovative economic knowledge. While practicing economic geography, as suggested by Gordon Clark, 'we can use all kinds of resources (including literature) to liberate our economic imagination. […] The "literary imagination" is no more antiscientific or antieconomic than the closed imagination of many theorists obsessed with the reigning conventions that rely upon stylised facts in economics and geography' (Clark, 1998, p.84). I think that a plurality of methods and theories in geography is needed for the investigation of diversity. For instance, while I understand the importance of quantitative research, I also strongly believe in the potential of qualitative methods for the production of knowledge. Economic geographers should not only mobilise methodologies and theories that are most useful in engaging in a dialogue with and in challenging orthodox economic thinking, but also with tools and concepts that can serve to give a glimpse of alternative possible worlds (Amin and Thrift, 2000). I believe that this has significant implications for research and politics in and out of academia. This is an urgent task. Besides having dramatic implications for the production of knowledge, it also has a clear practical significance for the framing of the terms of a much-needed transformative project in our turbulent times.

APPENDIXES

LIST OF INTERVIEWS AND ACTIVITIES

The following pages enumerate all the interviews and other main activities I carried out during my fieldwork in China. Relevant information such as date and place of the event, number of people interviewed, gender, and type of activity, with a cross-reference to the transcript or reports when available, is noted. According to the ethical guidelines adopted in the research, the list is organised in such a way as to preserve the anonymity of all interviewees. Their names and organisations have been substituted by nicknames. Original names are saved in a different list not attached to the dissertation.

List of Interviews and Research Activities

	Name	People	Gender	Date	Place	Type	Organisation	Activity	Data	Transcript
						Recorded Semi-structured Interviews				
1	French Scholar	1	M	12/09/13	Rennes (France)	Interview - alone	Academia	Waste management	Mp3, French	NA
2	French PRO President	1	M	09/10/13	Skype (Paris, France)	Interview - alone	WEEE PRO (FR)	WEEE	Mp3, French	NA
3	HX Manager	1	M	21/11/13	Beijing	Interview - with Tao Dongyan	Formal recycling	WEEE	Mp3, Chinese	DVD
4	TH Official	1	F	04/06/14	Beijing	Interview - with Tao Dongyan	Governmental body	WEEE	Mp3, Chinese	DVD
5	XF Informal	1	M	06/06/14	Hongfuyuan (Beijing)	Interview - with Tao Dongyan	Informal recycling	Household recyclables	Mp3, Chinese	NA
6	LW manager	1	M	17/09/14	Shantou	Interview - with Tao Dongyan	EEE producer	Machinery producer	Mp3, Chinese	DVD
7	J Beijing RLG	1	M	01/09/14	Beijing	Interview - alone	EEE PRO (international)	WEEE	Mp3, English	NA
8	TXF - official	1	M	26/09/14	Resource Institute	Interview - with Tao Dongyan	Research institute	WEEE	Mp3, Chinese	NA
9	CLW NGO activist	1	F	06/10/14	Beijing	Interview - alone	eNGO activist	Waste management	Mp3, Chinese	DVD
10	Veo Manager	1	M	09/10/14	Beijing	Interview - alone	Formal foreign company	Waste management	Mp3, English	NA
11	DXK - Informal boss	1	F	10/10/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan	Informal recycling	WEEE	Mp3, Chinese	NA
12	M Beijing RLG	1	M	11/10/14	Beijing	Interview - alone	Formal PRO (international)	WEEE	Mp3, English	NA
13	Informal boss 1	1	M	15/10/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan and Xiaoya	Informal recycling	Waste management	Video, Chinese	NA
14	Informal worker 1	1	M	15/10/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan and Xiaoya	Informal recycling	Waste management	Video, Chinese	NA
15	Informal worker 2	1	M	15/10/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan and Xiaoya	Informal recycling	Waste management	Video, Chinese	NA
16	Informal boss 2	1	M	15/10/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan and Xiaoya	Informal recycling	Waste management	Video, Chinese	NA
17	Informal boss 3	1	M	15/10/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan and Xiaoya	Informal recycling	Waste management	Video, Chinese	NA
18	QJ Informal boss	1	F	16/10/14	Beijing	Interview - with Tao Dongyan	Informal recycling	WEEE	Mp3, Chinese	NA
19	P Laoshi	1	M	22/10/14	Beijing	Interview - alone	Formal EEE producer (CH)	WEEE	Mp3, Chinese	Appendixes
20	M HP manager	1	F	31/10/14	Shanghai	Interview - alone	Formal EEE producer (US)	WEEE	Mp3, English	NA
21	Z XJQ manager	1	M	31/10/14	Shanghai	Interview - alone	Formal recycling	WEEE	Mp3, Chinese	DVD
22	C XJQ manager	1	F	31/10/14	Shanghai	Interview - alone	Formal recycling	WEEE	Mp3, Chinese	DVD
23	DLS Scholar and Official	1	M	07/12/14	Shanghai	Interview - with Tao Dongyan	Research institute	Waste management	Mp3, Chinese	DVD

24	LYZ NGO activist	1	F	10/12/14	Beijing	Interview - with Tao Dongyan	eNGO activist	Waste management	Mp3, Chinese	Appendixes
25	XYH - Informal boss	1	M	10/12/14	Beijing	Interview - with Tao Dongyan	Informal recycling	Construction Waste	Mp3, Chinese	NA
26	Informal boss Nanqijia	1	M	12/12/14	Nanqijia (Beijing)	Interview - with Tao Dongyan	Informal recycling	Waste management	Video, Chinese	NA
27	CLW2 NGO activist	1	F	12/12/14	Beijing	Interview - alone	eNGO activist	Waste management	Mp3, Chinese & English	NA
28	LZH Formal boss	1	M	14/12/14	Qiliqu (Beijing)	Interview - alone	Formal recycling	Waste management	Mp3, Chinese	NA
29	LLS manager	1	M	14/12/14	Beijing	Interview - alone	Formal recycling	Waste management	Mp3, Chinese	NA
30	LH Informal boss	1	M	17/12/14	Xiejia (Beijing)	Interview - alone	Informal recycling	WEEE	Video, Chinese	NA
31	LHM Informal boss	1	F	17/12/14	Xiejia (Beijing)	Interview - alone	Informal recycling	WEEE	Video, Chinese	NA
32	FHJ scholar	1	M	15/12/14	Beijing	Interview - alone	Retired scholar and official	Waste management	Mp3, Chinese	DVD
33	HJ Informal boss	1	M	17/12/14	Beijing	Interview - alone	Informal retailing	Second-hand market	Mp3, Chinese	NA
34	SQP boss	1	M	17/12/14	Beijing	Interview - alone	Informal retailing - admin	Second-hand market	Mp3, Chinese	NA
35	XJ Informal boss 1	1	M	17/12/14	Xiejia (Beijing)	Interview - alone	Informal recycling	WEEE	Video, Chinese	NA
36	XJ Informal boss 2	1	M	17/12/14	Xiejia (Beijing)	Interview - alone	Informal recycling	WEEE	Video, Chinese	NA
37	ZY Manager	1	M	NA	Tianjin	Interview - Anna Lora-Wainwright (alone)	Formal recycling	Waste management	Transcript Chinese	DVD

Recordings from Conferences and Visits

1	Ziya - visit	5	M	24/05/14	Tianjin	Presentations	Formal recycling	Waste management	Mp3 & Video	NA
2	Scholars & recyclers	10	F/M	21/05/14	Beijing	Conference talks	EPR Conference	WEEE	Mp3, Chinese & English	NA
3	Scholars & recyclers	21	M	02/11/14	Shanghai	Conference talks	UN Step initiative	WEEE	Mp3, English	NA
4	Scholars & recyclers	18	F/M	04/12/14	Shanghai	Conference talks	China Zero Waste	Waste Management	Mp3, Chinese & English	NA
5	NGO meeting	5	F/M	08/12/14	Beijing	NGO meeting	NGO	Waste management	Mp3, Chinese/English	NA

List of Main Non-recorded Interviews, Informal Conversations (IC), Visits, Participant Observations (PO), and Other Activities

1	Scholar 1	1	F	NA	Beijing	Informal conversations - alone	Academia	Waste management	Hand-written notes	NA
2	Scholar 2	1	F	NA	Beijing	Informal Conversation - alone	Academia	Waste management	Hand-written notes	NA
3	Scholar 3	1	F	NA	Beijing	Informal conversations - alone	Academia	Waste management	Hand-written notes	NA
4	Green Tech China	~10	F/M	24/09/13	Embassy of Italy	Conference - alone	Event	Sustainable development	Hand-written notes	NA
5	Shengtaidao Manager	~6	M	08/10/13	Beijing	Informal conversation - with Tong Xin	Recycling state owned company	Waste management	Hand-written notes	NA
6	CHEARI officials	~10	F/M	31/10/13	Beijing	Informal Conversation - with Tao Dongyan	Governmental body	WEEE	Hand-written notes	NA
7	eNGO activist 1	1	F	07/11/13	Beijing	Informal Conversation - with Tao Dongyan	NGOs	Waste management	Hand-written notes	NA
8	HFY - planning meeting	~8	F/M	23/10/13	Hongfuyuan (Beijing)	Meeting - with Tao Dongyan and Cai Yifan	Administration	Waste management	Report Chinese	DVD

9	(HFY) Recycler 1	1	F	23/10/13	Hongfuyuan (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	Waste management	Hand-written notes	NA
10	(HFY) Recycler 2	1	M	23/10/13	Hongfuyuan (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	Waste management	Hand-written notes	NA
11	(HFY) Recycler 3	2	M	23/10/13	Hongfuyuan (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	Waste management	Hand-written notes	NA
12	(HFY) archives	NA	NA	25/10/13	Hongfuyuan (Beijing)	Visit - with Tao Dongyan	Administration	Urban governance	Report Chinese	DVD
13	Dongxiaokou 1st visit	~10	F/M	11/11/13	Dongxiaokou (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	Informal recycling	Report Chinese & English	DVD
14	(DXK) Recycler 1	1	M	11/11/13	Dongxiaokou (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	Metals, electric cables	Report Chinese & English	DVD
15	(DXK) Recycler 2	1	F	11/11/13	Dongxiaokou (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	Metals, electric cables	Report Chinese & English	DVD
16	(DXK) Recycler 3	1	M	11/11/13	Dongxiaokou (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	Metals, electric cables	Report Chinese & English	DVD
17	(DXK) Recycler 4	1	M	11/11/13	Dongxiaokou (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	Wood, iron	Report Chinese & English	DVD
18	2nd family	2	F/M	11/11/13	Dongxiaokou (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	WEEE	Report Chinese & English	DVD
19	father	1	M	11/11/13	Dongxiaokou (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	WEEE	Report Chinese & English	DVD
20	2 shop (Lady)	1	F	11/11/13	Dongxiaokou (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	WEEE	Report Chinese & English	DVD
21	Peddlers	2	M	11/11/13	Dongxiaokou (Beijing)	Participant observation - with Tao Dongyan	Informal recycling	Metals	Report Chinese & English	DVD
22	eNGO activist 2	1	M	12/11/13	Dinner - Beijing	Interview - with Tao Dongyan	NGO	Waste management	Report Chinese & English	NA
23	Xiaoqu 1	~5	F/M	18/11/13	Haidian (Beijing)	Informal Conversation - with Tao Dongyan	Semi-formal recycling	Metals, WEEE, others	Report Chinese & English	DVD
24	Houbajia 1	~10	F/M	19/11/13	Houbajia (Beijing)	Informal Conversation - with Tao Dongyan	Informal recycling	Metals, WEEE, others	Report Chinese & English	DVD
25	Zhongguancun electronics	~10	F/M	19/11/13	Zhongguancun (Beijing)	Informal Conversation - with Tao Dongyan	Semi-formal retailers	Formal & second hand	Hand-written notes	NA
26	Huaxin	1	M	21/11/13	Beijing	Visit - with Tao Dongyan	Formal recycling	WEEE	Report Chinese	DVD
27	Shuangquanpu market	~10	F/M	23/11/13	Beijing	Informal Conversation - with Tao Dongyan	Informal retailing	WEEE - second hand	Hand-written notes	NA
28	Hongfu Jituan	~10	F/M	29/11/13	Hongfuyuan (Beijing)	Participant observation - with Tao Dongyan	Social experiment	E-Waste, other waste	Report Chinese & English	NA
29	Recycling (batteries)	1	F	12/12/13	Beijing	Interview - with Tao Dongyan	Startup company	Lead-acid batteries	Hand-written notes	NA
30	HH (Beijing) - Manager	1	M	12/12/13	Beijing	Interview - with Tao Dongyan	Formal recycling	Metals	Report Chinese	DVD
31	CY circular economy park	~10	F/M	19/12/13	Chaoyang (Beijing)	Visit - with Tao Dongyan	Formal recycling	Incinerator	Hand-written notes	NA
32	HFY	~20	F/M	21/12/13	Hongfuyuan (Beijing)	Participant observation - with Tao Dongyan	Pilot project	Waste management	Report Chinese & English	NA
33	DXK laoban	1	F	07/02/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan	Informal recycling	E-waste, waste	Hand-written notes	NA
34	HFY	NA	F/M	01/03/14	Hongfuyuan (Beijing)	Participant observation - with Tao Dongyan	Pilot project	Waste management	Hand-written notes	NA
35	Nanqijia	~10	F/M	01/03/14	Nanqijia (Beijing)	Interview - with Tao Dongyan	Informal recycling	Waste management	Hand-written notes	NA
36	HFY semi-formal	~5	F	07/03/14	Hongfuyuan (Beijing)	Interview - with Tong Xin and Tao Dongyan	Semi-formal recycler	Waste management	Hand-written notes	NA
37	HFY Archives	NA	F	08/03/14	Hongfuyuan (Beijing)	Participant Observation	Pilot project	Waste management	Hand-written notes	NA
38	Longjin informal market	~10	F	08/03/14	Beijing	Informal conversation - with Tao Dongyan	Informal recycling	Metals, WEEE, others	Hand-written notes	NA
39	X Dage	1	M	25/03/14	Changping (Beijing)	Interview - with Tao Dongyan	Semi-formal recycling	Waste management	Report Chinese & English	DVD

40	HFY Archives 1	NA	F	30/03/14	Hongfuyuan (Beijing)	Visit - with Tao Dongyan	Pilot project	Waste management	Archives	DVD
41	Green Earth - meeting	~10	F/M	08/04/14	Chengdu	Meeting - with Tong Xin	Social enterprise	Waste management	Hand-written notes	NA
42	Green Earth - project	~10	F/M	09/04/14	Chengdu	Interview & Visit - with Tong Xin	Social enterprise	Waste management	Hand-written notes	NA
43	Conference	~20	F/M	10/04/14	Shenzhen	Conference talks	EEE conference	Conference	Hand-written notes	NA
44	Foxconn / Fushiakang	~10	F/M	11/04/14	Shenzhen	Visit - with Tong Xin	EEE production	EEE production	Video & Pictures	NA
45	Second hand market	~5	F/M	11/04/14	Shenzhen	Participant observation - alone	Informal retailing	Second-hand market	Pictures	NA
46	Ziya	~20	F/M	17/05/14	Tianjin	Visit - with Tao Dongyan and Yvan Schulz	Formal recycling	Waste management	Report English	DVD
47	Binhai	~20	F/M	18/05/14	Tianjin	Interview & Visit	Formal recycling	Waste management	Hand-written notes	NA
48	CHEARI	C	F/M	21/05/14	Beijing	Conference	EPR conference	Conference	Hand-written notes	NA
49	CHEARI	C	F/M	22/05/14	Beijing	Conference	EPR conference	Conference	Hand-written notes	NA
50	Embraco	~20	F/M	23/05/14	Beijing	CHEARI organised visit - with Yvan Schulz	EEE producer	EEE production	Hand-written notes	NA
51	ZCZ Official MIIT	1	F	24/05/14	Beijing	Interview - with Tao Dongyan	Governmental body	WEEE	Hand-written notes	NA
52	Green Earth - interview	1	M	30/05/14	Email (Chengdu)	Interview - alone	Social enterprise	Waste management	Report Chinese	DVD
53	Tianbao market	~10	F/M	02/06/14	Beijing	Participant observation - alone	Informal retailing	Second-hand market	Hand-written notes	NA
54	Tiantongyuan	~10	F/M	04/06/14	Beijing	IC - with Tao Dongyan & Yvan Schulz	Informal recycling	Metals, WEEE, others	Hand-written notes	NA
55	DXK visit 1	~10	F/M	20/06/14	Dongxiaokou (Beijing)	Interview - Tao Dongyan alone	Informal recycling	Metals, WEEE, others	Report Chinese	DVD
56	Lao Yang 1	1	M	23/06/14	Dongxiaokou (Beijing)	Interview - alone	Informal recycling	WEEE, others	Hand-written notes	NA
57	Zhongguancun electronics	1	M	26/06/14	Beijing	Informal conversation - alone	Semi-formal retailers	Formal & second hand	Hand-written notes	NA
58	Lao Yang 2	1	M	06/09/14	Dongxiaokou (Beijing)	Interview - alone	Informal recycling	WEEE, others	Report English	DVD
59	Guiyu visit 1	~10	F/M	15/09/14	Guiyu (Guangdong)	Interview - with Tao Dongyan	Informal recycling	Metals, WEEE, others	Report Chinese & English	DVD
60	Guiyu visit 2	~10	F/M	17/09/14	Guiyu (Guangdong)	Interview - with Tao Dongyan	Informal recycling	Metals, WEEE, others	Report English	DVD
61	Dongxiaokou visit 4	~10	F/M	28/09/14	Dongxiaokou (Beijing)	PO - with Xiaoya and Chen Liwen	Informal recycling	Metals, WEEE, others	Report Chinese	NA
62	DXK visit 2	~10	F/M	12/10/14	Dongxiaokou (Beijing)	Interview - Tao Dongyan alone	Informal recycling	Metals, WEEE, others	Report Chinese	DVD
63	DXK visit 3	~10	F/M	13/10/14	Dongxiaokou (Beijing)	Participant observatin - with Tao Dongyan	Informal recycling	Metals, WEEE, others	Report Chinese	DVD
64	DXK visit 4	~10	F/M	15/10/14	Dongxiaokou (Beijing)	Visit - with Tao Dongyan and Xiaoya	Informal recycling	Metals, WEEE, others	Hand-written notes	NA
65	Hongfuyuan	5	F/M	20/10/14	Hongfuyuan (Beijing)	Meeting - with Tong Xin and Tao Dongyan	Administration	Waste management	Report Chinese	DVD
66	Lao Yang 3	1	M	23/10/14	Beijing	Lunch - with Taodongyan	Informal recycling	WEEE, others	Hand-written notes	NA
67	Xinguang Recycling	~10	F/M	05/11/14	Shanghai	Organised visit (UN Step Initiative) - alone	Formal recycling	WEEE	Hand-written notes	NA
68	Informal Market 1	~10	F/M	06/11/14	Shanghai	Informal conversation - with Tao Dongyan	Informal recycling	WEEE, metals	Hand-written notes	NA
69	Informal Market 2	~10	F/M	08/11/14	Shanghai	Informal conversation - alone	Informal recycling	WEEE, metals	Hand-written notes	NA
70	DXK visit 5	~10	F/M	11/11/14	Dongxiaokou (Beijing)	Interview - alone	Informal recycling	Metals, WEEE, others	Report English	DVD

71	DXK visit 6	~10	F/M	12/11/14	Dongxiaokou (Beijing)	Interview - alone	Informal recycling	Metals, WEEE, others	Report English	DVD
72	DXK visit 7	~10	F/M	18/11/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan	Informal recycling	Metals, WEEE, others	Report Chinese	DVD
73	RS EPR Manager	1	M	20/11/14	Skype (Beijing)	Informal conversation - alone	Expert	WEEE, EPR	Hand-written notes	NA
74	DXK visit 8	~10	F/M	21/11/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan	Informal recycling/admin	Metals, WEEE, others	Report Chinese	DVD
75	Social experiment DZM	~10	F/M	22/11/14	Dongzhimen (Beijing)	Participant observation - with Tao Dongyan	Social experiment	Waste management	Hand-written notes	NA
76	Hongfuyuan (informal)	~10	F/M	03/12/14	Hongfuyuan (Beijing)	Visit - with Tao Dongyan	Informal recycling	WEEE	Cpu notes	NA
77	Scholars & recyclers 3	~10	F/M	04/12/14	Shanghai	Conference - with Tao Dongyan	China Zero Waste	Waste management	Cpu notes	NA
78	Scholars & recyclers 4	~10	F/M	05/12/14	Shanghai	Conference - with Tao Dongyan	China Zero Waste	Waste management	Cpu notes	NA
79	Waste Institute - meeting	~10	F/M	08/12/14	Beijing	NGO meeting - with Tao Dongyan	NGO	Waste management	Cpu notes	NA
80	XYH - Informal boss	1	M	10/12/14	Beijing	Interview - with Tao Dongyan	Informal recycling	Construction Waste	Report Chinese	DVD
81	Xiejia - Informal boss	~10	M	11/12/14	Beijing	Interview - with Tao Dongyan	Informal recycling	WEEE	Report English	DVD
82	Nanqijia market	~10	M	12/12/14	(Nanqijia) Beijing	Visit - with Tao Dongyan	Informal recycling	Metals, WEEE, others	Hand-written notes	NA
83	Qiliqu - informal market	~10	M	14/12/14	Qiliqu (Beijing)	Participant observations - alone	Informal recycling	Metals, WEEE, others	Hand-written notes	NA
84	Shuangquanpu market	~10	M	15/12/14	Beijing	Participant observations - alone	Informal retailing	WEEE - second hand	Hand-written notes	NA
85	Shuangquanpu market	~10	M	17/12/14	Beijing	Participant observations - alone	Informal retailing	WEEE - second hand	Hand-written notes	NA
86	Xiejia - visit	~10	M	17/12/14	Beijing	Participant observations - alone	Informal recycling	WEEE	Hand-written notes	NA
87	DXK visit admin	2	F/M	19/12/14	Dongxiaokou (Beijing)	Interview - with Tao Dongyan	Informal recycling / admin	Metals, WEEE, others	Report Chinese	DVD
88	DXK demolitions	NA	NA	15/03/15	Dongxiaokou (Beijing)	Pictures - sent by an informal boss	Informal recycling	Metals, WEEE, others	Pictures	NA
89	MD NGO activist	1	M	07/05/15	Oxford	Interview - alone	eNGO activist	Waste management	Hand-written notes	NA

EXAMPLES OF TRANSCRIPTS AND SAMPLE QUESTIONNAIRE

The following pages contain two transcripts of interviews and a sample questionnaire for semi-structured interviews. As explained in the methodology, questionnaires have been changed and adapted to different interviews. More samples are contained in the DVD attached to this manuscript.

Transcript 1 – P Laoshi, Beijing, 22 October 2014, alone.

(first part of the interview before lunch)

（请教下您的背景）
我本科硕士博士都是在合肥工业大学读的，因为它做绿色制造做得很久了，后来又到清华大学段老师那边做了两年博士后，之后正好中间和 ZH、海尔有项目合作，合作后我就选择到 ZH 去了，然后就一直做这块。一直做技术，公司又承担了一个部门，这个是我工作的三分之一吧，我现在还做其他的，比如自动化啊，新的工艺新的材料啊，总共三块，绿色制造是其中一块。10 年是孵化了一个企业出来，在陈州那边，年产值大概在两个亿，专门做处理的，把多余的处理掉、有价值的拿出来，拿出来后再处理，再利用，利用到新产品中去。这是第一块，我大概背景在 ZH 这边，负责一个叫工程技术中心的单位，大概一百二十个人，下面还有一个子公司，大概八十个人。子公司也是我负责，它的主要工作是把我们的成功产业化，产值大概一年几千万，大概是这么个情况。
接下来是公司的情况。
ZH 是一个多元化的企业，产值今年是一年一千个亿人民币，做得有电视、空调、冰箱还有压缩机，空调和冰箱压缩机，还有军工，雷达啊通讯工具，还做一些房地产业务。多元化，做矿，因为现在整个制造业利润在下滑， 所以我们军工、房地产的利润比较高。

（最开始 ZH 是做什么的）
做军工的，就是机载火攻力量，当时国家做三个信息建设，把很多放到……

（请问 ZH 是国有企业还是……地方还是……）
地方国企。不是央企。四川的。这是大概一个情况，多元化企业，做了很多产品。这些产品以后都是废弃物，生产过程中间我们是清洁生产，就是不能有污染。采购的话现在叫绿色采购嘛，尽量要求很多方面采购回来后也是绿色的，铅汞啊这些中国有要求的，所以采购的时候不能

含这些有害的东西。制造过程中间环保局会管，所以我们有自己的环境管理体系，一个管理一个审核，每天都有，还有智能管理体系，整个公司对环保是非常重视的。ZH 为什么做拆解、家电回收，原因就是量比较大，两年前整个电视机市场四分之一是我们做的。因为我们量比较大，责任也比较大，所以我们领导就让我们公司去做这个事情。我就是因为这个才去的，要不然我不会去那边工作，对环保未来发展比较重视，这就是 ZH 的一个概况。大概九万多人，XX 发展一万多人，产值一千个亿。

四川 ZH 格润资源再生公司，就是我们孵化这个企业，刚开始是我去一个园区建立的生产线，一个拿到国家资质的小厂，那是 08 年，就是国家还没有搞那个之前我们就已经在做了。很多国家项目支持，08 年就拿了个资质，10 年就成立了一个大的公司，就叫四川 ZH 格润。这个公司呢，是 ZH 的一个子公司，下面的小公司，产值不算大，今年两个亿。10 年正式成立这个公司，代表我们正式进军这个行业，以前就是国家项目支持，相当于我们就做实验，现在正式成立子公司做这个，现在有四五百个人，占地两百亩左右，产值两个亿，处理家电一百五十万，这是今年的规模。

就是冰箱、洗衣机、电视、空调，今年是一百五十万台。现在比较特殊，国家以旧换新退出了，以前就是买电视，拿着旧的去，可以抵钱去买新的，现在这个政策已经没有了。没有了之后呢很多企业很难收到东西，我们企业能收到东西。为什么呢，因为我们企业以前是搞家电销售的，在全国有两万多个维修网点，电视手机坏了就帮你修啊，还帮你安装啊。就是你买新电视，我帮你送家里去安装调试，就这些我们全国两万多个门店，有的是直营的，我们自己的，还有的是加盟的。我们还有销售渠道，也能去做这个事情，所以我们企业现在有优势。因为如果你是拆解企业，你不可能在四川去搞很多门店去收东西，这个成本好高。我们有渠道，整合资源就可以了。我们现在有维修门店嘛，他报个牌子，我们就开始收这个，一台多少钱，那你送过去就可以了嘛。这个量也不算大，放在门店就可以了，给他点钱就当个兼职嘛。你如果去做这个事情，就是全职，房租啊水电，所以我们的渠道比别人多。而且不可能到处布点，单纯的拆解企业是没有这个能力的，所以我们的回收量非常大。在四川占的分量……在全国也可以收，以前以旧换新的时候我们全国九个点，就利用我们这个维修渠道去收，量也比较大。格润公司 10 年成立的，现在 14 年，去年收容量是全国的第三名，单个厂就第三名。因为中国资源再生公司比较大，它是在 guoli 有八个厂,八个厂加起来肯定比我们大，我们只有一个厂。前几年我们想收购几个公司，但因为各种原因没有谈成，下面可能要去收购。因为现在很多家电回收厂收不到东西，亏钱就要关门，就要把资质卖出去，所以这个时候我们就可以去收到我们手上。现在这个行业是资源为王，电视国家是有补贴，一台八十块钱，但你收不到啊就没有补贴。

（人工规模）

格润做的领域不仅是四机的拆解还有工业废气物，员工四五百人，人力成本一人三千左右，加五险一金大概四万。

（公司发展目标）

更多你可能关注的是格润。我们发展目标是首先做西南第一档，未来我们面向全国 ，收购很多企业回收很多资源，发展策略是通过回收资源进而掌控市场，收购一些企业。我们在和工信部

谈一个事情，就是工信部支持我们 ZH 做制造者责任研生制，EPR，工信部支持 ZH，拿 ZH 做试点。未来我们要在全国的回收链达到百分之二十，去年拆解大概四千多万台，我们只拆了一百多万台，占了百分之三吧，未来我们要达到百分之二三十，我们一家，所以我们也在布局，做分公司去收购企业，这是我们的发展目标。发展策略就是通过网罗资源收购企业来做，因为我们是国企，相对来讲我们做的公司处理是比较合规的，因为我们没必要去承担那个责任，因为我们不是私人是国企的人，私人的人就会想一些办法办法 ，环保不环保都处理。我们相对比较规范，个人不会去冒这个风险，因为不是自己的钱，赚钱也不是自己的钱，这就是大企业，也是为什么工信部要推进我们做试点，他们想要制造企业占到整个回收市场的六七十八十。因为他知道大企业好抓，你不会因为这个事情把整个公司耽误了，比方说我们公司一千个亿嘛，格润在两个亿，我不会为两个亿把公司品牌损失了，所以工信部也希望制造企业有更多的人来做，现在 ZH 格力 TCL 也在做这个事情，这样对国家是有益的，对环境是没污染的，私人对环境有污染的也会处理，其实还是污染的。这个是发展策略。

（公司产品中最盈利的是什么？）

这个现在是不赚钱，对格润来讲是不赚钱的，赚钱的是什么，国家补贴。因为电视一台八十块钱，收购一台就六十多块钱，所以没有补贴不可能去做。就是拆材料再改进利用后，也买不了六十块钱。所以这个不赚钱，因为是环保事业，国家扶持。因为不赚钱，所以国家补贴。

整个是不赚钱的。因为我做电视机啊，电视机拆解完再卖不赚钱，但是我单做一项，做线路板、PCD、计算机的 mainboard、手机的，单做一项，比如回收塑料是赚钱的。塑料分几部分，第一就是外壳，塑料键盘，这个拿来改进新赚钱，但整个电视拆解完改进还是不赚钱的。我们现在已经在做了，比方说我们到市场收塑料，只收塑料拿来改新在电视上，供厂商运行，就在我们产品自己身上，是赚钱的。这个是很容易算的，比如市场价四五千一吨，改进成本七八千，我还能卖一万，OK！线路板也一样，线路板拿来是五万，中间我给弄出来，也赚钱。所以单项可以赚钱，但是做环保，必须考虑整个的。电视机是整个的，不能只考虑一部分，所以我们收购电视机一台一台来，其实都是亏本的，靠国家补贴。但在这个业务之外，我另外去做是赚钱的，去收线路板收塑料，单做这个业务是赚钱的，现在我们也在做。

（我听到一个数据，环保部发布的白皮书里面统计的一些大的数据，2012 年时大方向都是定制回收的四机一脑那些产品，冰箱空调洗衣机，那个还是比较小方向，我不知道你们的情况是不是这样的）

电视至少占百分之六七十，空调很难收，因为空调本身铜铝金属价值很高，不要也没必要给你，而且污染相对比较小，就线路板和制冷剂，那个东西市场自己能消化，不会进入到那个渠道。

电视机是收六十块钱，但不值六十块钱，所以收不到。我是个私营企业，去市场上买个电视机，六十块钱，如果电视机 还能看我卖给小旅馆，还能赚些钱；如果不能看，这个时候其实六十块是亏本的，这时没人要了才能进到我们这个渠道里，这实际上是必然的过程，是经济价值决定的。所以电视机是大部分都能收的到，坏的不能看的，空调收到的也有，但是很少。然后，

冰箱，都不想要，为什么呢，因为国内现在用的处理设备都是那种大的……就是冰箱一进去啪啪啪先把压缩机去掉，然后扔进去嗡嗡嗡，出来塑料啊泡沫啊就完了，能耗太高不赚钱。

（收到的补贴也不赚钱）
对，补贴也不赚钱，所以很多人不做这个生意，这都是市场经济所决定的。因为体积大，运输费用高，很不划算，所以冰箱占比例也很少。空调也很少，计算机也很少。计算机因为有价值比较多，也比较少。电视最多，然后洗衣机、冰箱、空调，计算机也不是很多，大概是这么个结构。
所以盈利比重没法回答，因为整个不赚钱，单做赚钱，公司单独做塑料回收、线路板回收，这个是赚钱的，整体如果国家不补贴是亏本的。

（原料来源，上下游市场）
我们来源就是市场上收购的电视冰箱洗衣机……通过我们自己的门店，自己的渠道，还有网上的渠道，通过电话啊网站啊去交流去收，比如我在成都或北京，家里有三台，在上面登个记，然后等着有人来收。小商小贩地收，推个车收到一个中等的供应商那儿，我们和这个中等的供应商对接，或者我们自己收，这些通过各种渠道都有，网上收，到家里收，到卖场收，各种各样方式。

（上下游关系，市场怎么划分）
对于拆解不了的东西，比如荧光粉，这种东西我们不处理，因为我们没必要每样东西都自己做，太贵了，就交给有危废资质的企业去处理，他资质里有荧光粉处理，就给他钱。下游市场一个是这个危废处理企业，不好处理的荧光粉啊就给他；还有就是改进，塑料要改进新的产品，把它卖给 ZH、ZH 的子公司；然后金属类线路板打碎，金属拿出来卖给冶炼厂，铜拆下来也卖给物资回收那种回收贵重金属的企业，还有冶炼厂、危废处理企业，这是下游企业。还有成立内部公司，旧塑料加新塑料，加上改新剂，混合起来，最终变成一个产品。

(second part of the interview, during lunch)

我要用到电视、冰箱、空调上去的，这是我们自己的公司。还有就是买卖关系，危废处理的，就掏钱给他，东西给他。我们和国家的关系，我们是国家的，国资委的。现在我们处理电视冰箱空调，国家是有补贴的，还有就是有国家项目支持，国家给很多项目支持我们，包括四川省啊工信部啊发改委啊科技部啊。

（这些项目都是什么样子的）
比如说再利用啊，拆解设备啊，再制造啊，就给一些项目支持，包括线路板处理，塑料处理，国家给的都有钱。

监管是这样的，是环保局，因为资质是环保局给你的。是地方环保部，不是国家。但国家几个部委是这样的，你要得到拆解的资质，它就要审核你，环保局、发改委、工信部、财政部，还有其他一些协会，他们审核你。补贴之前，这个资质，它们先审核你的工厂，有很多规范，比如你的厂有多大面积，有什么设备，用什么工艺，什么员工保护，环保处理比如危废处理哪去了，都有规定，还有监控系统，它们在北京都能看见你现场的情况，这样的话相当于政府有一个很强的监管，因为它补给钱给你，你说你产量多少是吧，所以它用录像等各种各样的形式来监控你。

（华新一些人说现在企业才收到 2012 年的资质补贴，是不是）
这个和你跟财政的关系还有关系，因为这个钱是财政部补贴给你。国企嘛，买一台就要交国家钱吧，钱是交给财政部的。财政部根据环保局审核的结果，地方政府还掏一部分钱，四川税务还会接收这个，最终导致这个过程比较复杂，肯定需要沟通协调，但肯定会拖期，因为它不是说你成立就过来审核你，肯定是你处理几个月才过来审核，所以这个肯定是滞后的。刚开始你买电视要掏钱吧，等了一年半年之后才给你钱，这个确实会耽误。

公司的运营肯定受到法规的限制。比如说上次说的电路板处理方式，国家说不能用湿的，那我们就用的干的，你的所有的运营必须要符合国家的规定。
废弃物这几年出台的政策应该是比较少的，国家法律有一些基础规范之类的，真正的法律以前出的比较多，物体废旧管理，这几年出的比较少。

（贵公司和国内同行关系）
这个问题不好讲。怎么说，我们和四川省的关系，先将四川省内，现在有五家处理企业，以前是四家，竞争关系，原因很简单，市场基本上是封闭的，因为运输半径有限，还有国家有规定危险废弃物不能外移，所以在四川的，一般不会运到别的地方去。所以就是竞争关系，比如这个市场收到二十万台，我们五家抢，看谁能拿到，这是在四川省内是这个关系。在全国的话竞争不太大，主要是在四川省内大家竞争，其他省的都是同行关系，没有什么直接竞争，但不排除以后回跨省运营。但要考虑成本，成本高了不划算啊不赚钱，从北京把一台电视卖到四川去，运费多高啊，不可能。

（现在国内是否有同类外国企业）
跟我们直接竞争的，现在国内已经也有了。台湾在四川有几家，国外也有，但和我们没有直接竞争关系，比如日本同和，在苏州不都有参股嘛，还有天津，都有股份。现在暂时是地域问题，跟外企没有竞争，台资也是国内嘛。

（地方政府会不会保护这些企业）
现在保不保护看谁能拿到东西，看谁能收到这些物资。收得到就是收到，收不到能咋办，你就没饭吃嘛，所以现在不存在这个保护关系。

（非正规的对你们有没有影响）
肯定有影响。它怎么赚钱怎么弄嘛，线路板，它用火烧就完了。有，还是少，在吉林交界那个地方，在山里。拆解的话，把电视搞二手的，国家也支持，二手家电，把它修好还能用。相对来讲，二手的话对我们影响不是特别大，因为现在我们处理的大部分都是不利用的，但是肯定是有影响的，它把规矩弄坏了，因为它成本低，职工不用交五险一金，不用那么大的厂房，不需要正规设备，对我们肯定是有影响的。

（现在行业协会的组织对再生资源起到什么作用）
重要的协会。中国资源再生协会、中国循环经济协会，主要这两个。
中国资源综合利用协会，还有商务部一个物资协会，下面也有再造啊一些……刚才那个是发改委下面的。工信部下面的协会现在基本上没什么动作。
行业肯定有协会是比较好的，一是推动行业发展，还有交流学习的平台。

（再生资源协会中除了政府协会之外，是否还有其他相关角色？行业里面哪个部门是比较重要的，政府部门环保部工信部企业的，除了这样的，还有哪些部门对企业可能有影响）
高校研究所。中科院有个叫什么资源研究院，这些研究院会推动技术的发展，还有你们做调研。其他，我就没有了。
还有地方政府。政府分国家级的和省级的，其实都有比较大的影响。包括税务税收，有的地方，像这个行业买东西是没有发票的，我去你家买个电视是没有票的，所以增值税等各方面税收影响是比较大的。
地方政府啊，行业协会啊，高校研究所啊我们经常联系。研究所我们都有技术合作。联系发展比较重要，因为不可能什么事情都自己做，我们相当于整合资源，而且有些事情需要政府去主导，像税收还有行业规范、未来发展。包括技术进步需要高校研究所，研究所还有企业去一起研究新的技术。

（资源回收行业前景）
这个我觉得是比较好的。因为矿越来越少，所以回收越来越吃香，行业会发展越来越好，但是要规范，要环保，避免二次污染。困难就是技术还不够，比如上午大家讲的荧光粉的技术，其他一些具体的处理技术，还有设备需要更加的能耗小，比如冰箱处理设备技术上还需要去突破。这是技术上的困难，还有政策上的困难，税收啊国家补贴啊。

（随着时代发展的话，有很多不是我们传统的家用电器产品，可是现在有很多很新的产品，和目录不太吻合）
国家现在开了很多次会讨论目录增设问题，这个是发改委在做的。目录是发改委管的，后面可能会公布，手机、打印机、复印机、传真机还有荧光灯等第二批加入目录，第一批不是四机一脑。这需要一个过程，需要考虑面大面广，产业报废的量，如果太小的话不关心嘛，所以马上会第二批加入。

再随着时代的发展，新的东西一个是新的技术，再一个需要过程。国家会逐步加进去，欧洲处理门类比较多嘛，比较细。

（2012 年时候，欧盟就才创立这个，因为之前还有很奇怪的现象就是有时候市场就出现了电子烟，然后不在目录里大家都不知道要做什么，他们就改变 open scope，然后所有的电子产品都在里面了）

国家的处理方式不一样，中国和欧洲的处理方式不一样。中国比较大，管理监控比较困难，一下子那么多的话不太好。先挑关键重大的大件试点，摸索成熟后管理体系……最开始瞎糊弄，监控也没有，现在监控也有了，软件系统也有了，补贴审核什么的都规范了，再慢慢加，一个个地规范起来。欧洲可能情况不一样，大家处理方式不一样，经济情况也不一样。算是特点，先找一样东西试点一下，抓到成熟了再扩大，国外可能说我制定法律精神都要执行，情况不一样，经济水平不一样，中国有些地方经济水平太低，有些地方比较大，跨度比较大，政策考虑问题比较成熟，不能因为搞这个事情搞得受损失了，要考虑公平性。

（来看 EPR。生产者先通过 EPR 回收废品，他们很多人批评生产者责任制度对回收处理的影响太大的，员工的工资不是太好……生产者为废的付钱了给财政部，财政部考虑压力给补贴，有些生产者觉得不太公平，现在有非常小的生产者他们不交了，我知道工信部以前有生产者代表制度，可是现在可能……我想了解下你对这方面的看法）

我觉得这种最好走向一个平面，消费者电视扔的时候不要钱，像日本欧洲那样不用了就摆在小区里面，由回收企业收来拉回去处理。因为你用了嘛，就产生能耗，要污染环境。当然生产者也有责任，毕竟是你生产的，交也是可以的。但我觉得最好的是这个电视以后就不要钱了，现在在市场上买会产生很多问题，恶性竞争，比如在一个省，电视在那儿摆着，你收 50，我收 55 要不然我拿不到手啊，恶性竞争。竞争的结果是什么，他把环保降低，有这种可能嘛，因为不赚钱了嘛。最好说，第一个电视拿给这几家企业，国家有一个系统来管理，交给谁交给谁。平时，国家给一个批，从我们生产者收一点，该补贴给谁，我觉得这样的模式还好。当然我觉得像日本那样消费者付费我觉得不太可能。

（为什么）

因为经济条件。电视废的时候很多人用那个旧电视，电视新的时候就淘汰，但还能用的时候就流到农村，流到三四级市场去，让这些付钱是不可能的，所以我觉得这个模式在中国还不太合适。

（发改委什么时候做那个新的目录）

一直没发布，我也不知道什么原因。

Transcript 2 – LYZ NGO Activist, 10 December 2014, with Tao Dongyan.

2008 年的时候，国内有很多环境问题都受到很多关注，北京的水污染问题、固体废弃物问题还有大气污染问题都被提出来了。那段时间也是国家上面安排很多设备的时间，0708 年的时候阿苏卫填埋场还在筹建，当时我们也是大兴土木建各种设施，所以当时环境问题也比较突出，垃圾问题也慢慢浮现出来了。08 年中的时候我们接到阿苏卫填埋场周边居民给我们打来的电话，向我们控诉填埋场的臭气还有污染问题。

（这个填埋场是北京市一个正式的还是……）
对，阿苏卫当时是北京最大的垃圾处理企业。在阿苏卫问题特别大的同时，附近的居民还听说那边要建一个焚烧厂，就在六里屯阿苏卫那块。阿苏卫是填埋的问题，六里屯主要是要建一个焚烧厂，当然它那块也有填埋场，这些东西都是比较集中的。我们当时就接到了一些居民的投诉，我们就去跟进了这个问题，当时我还不在这里，是隔壁总干事张国军还有固体废弃物处理团队去做了一些考察，发现了这个问题的严重性，焚烧会带来一些问题，环评不公开，征集群众意见这个步骤做的不到位，所以我们就慢慢开始介入到这个问题中。开始是帮助这个群众去维护他们的权益，后来我们就成立了固体废弃物的团队叫城市固废组 ZZZZ，专门关注这个垃圾问题。北京是从 02 年开始推出垃圾分类的试点小区，中间没什么动静，05 年推了一次，到 07、08 年的时候又推了一批，之后基本上每年都会增加一批，现在基本上已经有两千四百多个垃圾分类试点小区了。我们在 10 年的时候对垃圾分类试点小区做了一个大规模的走访和调查，发现了北京在推行垃圾分类时现在有的很多问题，之后 12 年我们又做了一次调查，还做了一个北京市垃圾管理全链条的一个调研，梳理了当时垃圾管理的一个路径，从社区到运输到后端的处理，还有管理体系的一些问题，都做了梳理和调查。其实北京包括全国比较早成立的关注垃圾问题的小组就是 ZZZZ，后来 ZZDD 也成了垃圾学院，大概是 10 年的时候，很多的环保组织也开始关注这个问题。但北京现在有一些问题就是垃圾问题介入很困难，想要改变它是很难的。一个是，比如我们看到一些问题，我们垃圾的宣传教育还有后端的处理上面有很多问题，但是我们向相关部门去投诉或者去揭露这些问题的时候会遇到很大的阻力。北京其实现在很多的环保组织在垃圾问题上主要还是做一些宣传教育活动，专门做垃圾问题的组织其实是越来越少的，像以前做垃圾问题的组织地球村现在已经不做了，他们现在主要在农村啊做一些工作。现在北京这边我们 ZZZZ，ZZDD 还有环友科技，但是现在环友科技问题很大。

（环友是一个企业还是……）
不，环友也是一个民非注册的。他们会有一些 JICA……是日本的一个学术机构但会有很多基金去支持国内的实践。环友和 JICA 这几年有一个废油制肥皂的项目，也是垃圾减料，所以他们在这块也比较关注。

除了环友科技之外，还有一些不是专门关注这个的，不是细致做这个的，比如说像爱思创新他们是专门做社区的 NGO，也有垃圾减量的这一块；像地球站专门做二手物品的交换捐赠，衣服这些，其实也属于垃圾减量。其他一些机构会有专门做一小块的这种，还有现在就是有很多推广酵素，enzyme,是现在国内推广特别多的东西……刚才忘讲慈济了，慈济是台湾发起的特别大的一个环保宗教团体，他们倡导这种向善啊，有点佛教的那种，这个组织现在做得还算比较好的，他们的志工很有奉献精神，他们在素食，健康养生啊，环保啊各方面都有志工活动，social worker，但志工一般都是有一些信仰的，更像 volunteer，但 social worker 更有专业背景吧，一般这种 volunteer 都是 housewife。他们会做很细致的垃圾分类工作，把社区垃圾很细致地分类，比如塑料就会分成八种，很多全职太太 housewife 还有老年人会帮忙做这些事情。慈济也是推广酵素推广的比较多，这个问题需要我们辩证地去看，他们融入很多的宗教色彩在里面，其实有点像传销了，扩张得很厉害，那其实也挺不好的。

我们现在做垃圾减量其实有很多的问题，相对其他机构来讲，我们机构可能工作的领域比较多。首先像政策方面，我们会有政策研究和政策干预，会有调研的工作，field research，比如我们这两年做过的调研有垃圾分类试点小区的调研，有关于餐厨垃圾处理设施的全国调研，垃圾分类物业层面的调研和访谈，有关于废电池方面小的调研，还有关于发放餐具、中小学生每学期被强制包书皮等现象的调研。不像学术机构做的很需要数据分析，我们会有，但更多的是集中在访谈上面。

（你什么时候参加的 ZZZZ）

12 年 7 月 4 号正式入职，之前会有志愿者活动、实习之类的，大概 10 年开始接触的吧。

除了调研和政策建议，还会做一些提案，包括一些信息公开的申请，写一些公开信 open letter。

（我看群里在写十三五计划的一个提议，就跟你们类似？）

对，其实你看我们也会对他们的提议做出回应嘛。像这种提案的话，大家要一起做出谋划策。我们有时候写一些公开信的话，也会联署，影响力会相对大一些。

（临盟到底有多少家机构？在北京有几家？）

在中国十八家。在北京四家吧。现在主要负责人是采轩，是芜湖生态中心的，安徽那边的。除了调研和政策建议外，还有很大一部门是社区的工作。当然社区工作现在是要少一点，之前我们也是在做试点小区，包括现在我们在三个小区里有工作。还有就是学校教育，我们有个比较大的项目就是做垃圾分类的教材，textbook,不光是一本书，是一整套的课程，也做了课件。教材叫废弃物与生命，除了教材那本书还有每学期的课件啊背景资料包和视频素材。这是在中学生推广垃圾分类，会找一些学校去合作去开课，也寻找一些临废弃学校。还有对教师培训。我们会征集全国中小学教师来参加我们的培训，然后回去开课。还在做临废弃学校的实践，在学校里做很多临废弃的尝试，带他们做很多活动，对这个学校的垃圾处理做整体的规划。

还会对大学做垃圾分类的指导，经过一年的实践，大学这边的效果比较好。

(哪一个大学关系比较好)
北理工、民族大学、中央财经大学和外经贸，还有北航。
其实之前都是学生社团的会长来找我们，我们给一些方案和建议，后来觉得在社团，他们努力做的话就会做得很好，我们也希望推广这种方法，因为它很简单，就是宿舍楼干湿分类，而且可以持续。它其实是宿舍垃圾处理体系的规划，但是基于原有的硬件设施跟学校的一些资源，比如它处理垃圾是和食堂的一起运走的，这种方法可能一般在社区做不到，但在学校是可以做到的，所以我们觉得这种方式还是值得推广的，而且对节约资源有很大的贡献，所以我们希望在明年在更多的高校推广这种实践经验。其实就是学生在宿舍里面对垃圾进行干湿分类，没有干湿分类之前很多纸啊塑料啊之类的会收到严重的污染，后面很多拾荒者就不会去捡这种混在一起的垃圾。那干湿分类之后，纸啊塑料这些负责打扫宿舍卫生的保洁阿姨就可以去卖钱，之后拾荒的人也可以捡走去卖钱。我们原来学生在考期会印很多课件啊 PPT，考完一门可能就扔到垃圾箱了，同时很多学生因为要复习，就会在宿舍吃盒饭，吃完后不盖盖也让在里面，就会混合得很厉害，所以在宿舍里面干湿分类是很重要的，也是我们想要推广的。这是高校部分，我们也有公众倡导的一些活动，我像会不定期的举行一些手工坊，就是废品再生、变废为宝的活动，或者做肥皂做酵素，其实跟 ZZDD 有点像，但我们做的频率没有他们高，外出做一些参观啊讲座什么的。也会发通知，因为我们也积累了一些长期参与的这些人嘛，会告诉他们，然后他们来参加。可能他们之前参加过我们的志愿者啊调研啊讲座啊，我们也不想之后就断了联系，所以也会定期让大家一起聚一聚。像 ZZDD 也是希望能抓住这个志愿者……

（你们和 ZZDD 联合办活动吗）
经常，像前两天那个会。礼拜一那个。他们是联系嘉宾，其他费用都是我们出的。

（你们主要对接的政府部门是住建吗？）
称不上对接哪个部门，垃圾问题涉及很多部门，可能遇到哪个部门我们就和哪个部门打交道。

（那你们联系的部门是哪些）
联系的部门其实是市级宣教中心，还有固废处。

（固废处是下属于哪个部门？）
我估计是和住建部联系不大。城管委和住建部是有……

（你们和城管委有联系？）
有一些，但目前我们和政府部门的对接还比较弱，我们更多的还是和个人，比如宣教中心主任，他其实也是管北京各种各样垃圾分类的培训。

（它们是政府部门下面的事业单位吧，它们是给政府提建议的，你么联系的其实是给政府部门做智囊的这些人，并没有直接和政府部门打交道或者是打交道比较少？因为中心什么的一般都是部门下面的嘛）
对，宣教中心是这样。ZZZZ 本身也会有些人大代表啊，每年都是直接通过人大代表送提案。我们的理事啊还有发言人都有人大代表。每年都会通过去我们的渠道去提交提案，而且基本上是每个组都有。

（有关什么的）
比如垃圾团队会至少有一份提案。公众参与他们主要会做一些法律方面的维权，还有信息的公开申请啊，还有推动空气大气立法的这些项目，低碳家庭和环境教育团队也可能有提案，可能我们都会一块交上去。

（ZZZZ 挂靠的政府部门是哪一个）
主管单位嘛。我也不太清楚。

（因为我听很多人说过国内 NGO 很大的一个问题就是挂靠这个，注册，包括后面办活动都会有很多限制）
我们的主管单位应该是政府部门。

（你最开始怎么对垃圾感兴趣）
小时候喜欢动物植物嘛，一直对环境保护这个问题感兴趣。一开始对野生动物保护感兴趣，看杂志，后来参加志愿者活动，上大学的时候。我一开始好像参加的是 ZZDD 的讲座，就接触到了垃圾这个问题。就参加了各种各样的志愿者活动吧，我后来发现垃圾问题很严重，包括自己扔垃圾时，我之所以回去做宿舍垃圾分类就是我做学生时看到这个问题太让我揪心了，所以慢慢会更多参加这种实习。ZZZZ 已经 20 年了，平台比较大基础比较好，会有很多规章制度章程，让我觉得会得到更多的锻炼和指导，所以我后来选择 ZZZZ。

（本科室的专业和这个有关吗）
环境工程。垃圾处理方面专业知识我还是有，也还有一点对口。

（这个是 ZZZZ 北京的总部吗？这里一共多少人？）
对。全职是 17 个人，还有兼职和实习生，主要现在大家都在外面开会什么的。

（你们这边也有些外国员工？）
原来有，这种实习生会有很多。长期的有一个外国人在这边。现在我们有个实习生，英语方面非常棒，所以暂时也不需要外国志愿者。原来我们有一个德国顾问，在 ZZZZ 做了三年吧，但

去年走了，项目期就到了，因为它是一个德国和中国援助的项目。他给我们留下了非常深刻非常好的印象，他是东德和西德刚刚合并时期绿色和平的创始人，之后和平后他是总的负责人。

（现在北京也是有个绿色和平？）
对，北京的 GREEN PEACE 做的挺不错的，他们光做传播的就有四十多个。

（但是 GREEN PEACE 不在临盟里面）
不在，国际性的不多。临废弃联盟。

（像 BBBBB 他们是代表广州政府部门？）
不，他们也是一个 NGO，叫 ECO-CANTON，主要是做政策倡导，调研和信息公开，就我们的第一项。他们做的非常专业，比我们好多了，所以会跟政府有很多的接触。
他们是独立，很有想法的公益组织。内部会有定期的共识会，NGO 的培训啊，基本上每周五或隔周五会有午餐分享，某一个团队或项目分享自己的经验。整个机构的基础工作还不错。

（ZZZZ 在北京有 17 个人，做垃圾的有多少？）
垃圾团队目前就俩人，加上我。目前我们团队非常需要人，也在招人。之前是五个人，但有的生孩子回家了，有的本来就是香港台湾德国那边的，项目期到了就会去了。现在我们主要做政策倡导那部分。刚才我给你们讲的几大部分，第一部分政策建议和调研，现在我们缺一个人来做，我主要做的是教育，课程还有学校方面的工作。当然，社区和公众这方面的工作我也会不定期地去做，然后我另外一个同事主要做社区和不定期公众活动。临盟这块也是我来负责，因为之前那个同事生孩子回老家了。

（这边是不是人员流动性挺强的？）
对。

（一般大家离开一个 NGO 下面会去哪儿，是去另外一个 NGO 还是……）
有的回去企业，像男士需要养家糊口，因为我们工资不是很高，会坚持不下来就去企业工作去。我们之前有个非常棒的同事，是哥伦比亚大学的硕士，之前在公众参与团队工作了三年，很多的设想非常 devoted，但最后还是迫于生活压力去做了商业律师。还有一些问题就是 ZZZZ 不能解决户口，还有各种各样一些问题，主要是工资上。我们 NGO 之间的流动也很多，一般是接着结婚、生孩子的契机休息一段时间转成了兼职，去别的地方了。我两年半已经算长的了，我们这边工作最长的一般都是北京的本地人，包括我。外地的同事一般流动性会强一些。

（而且没有户口的话留下来很难。）
对，租房子这些。经济压力会很大。

（那 ZZZZ 创始人梁从诫先生现在在 ZZZZ 内部还有什么具体工作吗？）
梁从诫先生在 10 年底去世了。

我们现在的老会员很多是因为梁从诫成为 ZZZZ 会员的。我们是 1994 年成立的，成立头几年我们要求入会的会员些纸质的信，手写的，很多会员都写好多页，为什么要入会，他们对中国环境问题非常有热情，也非常焦虑。现在我们和这些老会员也会保持一些长期的联络，我们在每年的年会还有志愿者答谢会上也会专门把他们邀请过来，这些人都是在环保的一线上奋斗了很多年，非常厉害。

（我们经常去东小口、天通苑那边，你对非正式的回收部门有什么想法，你觉得他们是提供一个服务还是他们的环境影响太大了……）
对于我们来说，我们一直是拾荒者看做为国内资源回收利用做贡献的一批人，虽然他们会在一些方面扰乱秩序，比如他们会弄开弄得很乱，包括会在纸上浇水做一些手脚，但是他们是对国内提高资源回收率贡献非常大的。我们国家之所以比美国英国等很多国家资源回收率高，就是因为有很多这样的人这样一点一点把东西捡走。我们后端的资源回收体系非常大，如果没有他们，我们会非常糟糕。但现在的问题就是，目前看来大趋势是他们会逐渐走出历史舞台， 因为现在废品回收市场非常不景气，所有的价格走一直在下滑，所以捡东西的这些人捡一个瓶子以前能买一毛钱，现在只有八分钱，捡一包塑料袋，以前能卖三四块钱，现在只能卖八毛钱。而且现在物价一直在上涨，做这个的会越来越少，觉得没有利润可图了，慢慢的可能就没有了。所以我们现在非常担心这个问题，以前国家是靠市场来调节废品回收行业，现在就目前的情况来看，市场已经几乎不能调节了。像这些拾荒人，还有非正规摊贩……在我们看来非正规摊贩有另外的问题，就是这些非正规的甚至是 illegal 的废品回收商，规模其实非常小，当然我不是说小区门口开着三轮车收废品的人，他只是处理环节，问题出在后端的处理环节，这个环节非常不正规的话，会有很严重的二次污染问题、资源浪费问题，这个我们是很严肃地去看待的。如果排放不达标、资源没有充分利用、收回不彻底，在资源回收的末端这方面，我们还是很希望由非常正规的企业来做这件事情，所以我们会和很多正规的再生资源回收公司合作。

（是怎样的企业？）
比如说天天洁，他们是很大的再生资源回收公司。

（他们也做社区回收。他们后端做的很少吧？）
不，他们有自己的再生纸厂。但塑料什么的很少。

另外就是盈创，非常大的公司，包括在政府都有非常大的影响力。这种公司的话，排放啊利用率都有保障，包括对员工的待遇。给予各种原因，我们肯定是提倡大家把自己的可回收物交给正规的企业来处理。

现在另外一个问题正规公司比非正规公司给的价格低，因为非正规的回收成本低，这是个很大的问题，我们也在探索，一个是宣传教育，也在探索新的商业模式，让居民把东西交给正规公司。政府方面我们也会 force 他们去规范化废品回收的产业，但是现在政府在打击非正规作坊的同时没有鼓励正规的，这是个很大的问题，我们也在提建议。

（非正规企业有比较大的影响，可他们很多年都做了那个事情，所以很多人提出可以规范化他们。）
这个确实很重要。现在既然不能由市场来调节的话，我们可能需要这种鼓励。其实政府一边打击一边是要鼓励的，光打击把这些打死了，又不鼓励正规的就……或者说可以给更多的补贴和激励，把不正规的变正规的，但是我们是没有钱的，只能提一些建议，只能由政府在这方面做更多的工作。

（你们的提案工作也和这样的有关系？）
一方面在学校或社区里面，我们提倡把东西交给正规的公司去处理，一方面在政策建议方面我们会提出很多的意见，让政府激励非正规变成正规。

（新的意见，有关电子废弃物的案例那个）
对，包括这种有害的废弃物。前两天蒙达不写了提案的建议草稿可以给你们看一下。是十三五规划的一些方案，里面具体建议中包含了大多数前几天我们会上提出的很多政策方面的建议。这个里面没有提到危险废弃物和玻璃，我会补充但基本上比较全了，主要是我们现在对政策方面的建议和想法。

（你说在社区和高校会鼓励他们把东西交给正规的企业，所谓的鼓励是指……）
就是宣传。告诉他们一定要……

（但并没有搭建起他们的一个平台）
有啊，我们在学校，比如北京五中，告诉他们天天洁会有这样进驻的项目，现在他们资源小屋还有办公室里办公用品的资源回收都是由天天洁重点完成的。
其实是我们把信息给了学校，学校去联系，就是牵线搭桥。

（你们的工作在垃圾里还是比较重视干垃圾和湿垃圾的分类，干垃圾是后端的不管是拾荒者还是保洁，由他们自己分就可以？是这样的思路吗？）
对。因为本身国内的垃圾还是有人去捡嘛，所以我们的中心思想就是干湿垃圾分类，做到干湿垃圾分类之后，再把危险废弃物分出来，再把可回收物分出来，再细化一点的话可回收物再按照塑料、纸张、玻璃、金属分开。我们会告诉大家，因为塑料价值低可以送给收废品的人，一层一层地吧，宣传倡导。

（在大学做这样的教育，我了解是需要和一些机构合作的，你们基本上是怎么样的结构？）
这两块不一样。社区的话先和居委会做些接触，看居委会和小区的硬件条件，小区是不是有文艺团体啊新闻团队，这些硬件都有的话，再和居委会商量他们愿不愿意做，这些都定下来之后，我们会找到居委会上面的街道负责人，希望得到他们的一些支持。和街道说完之后，会回到小区。当然还有些小区有物业，也会和这方面的人做沟通。然后去找到，比如他们有环保小组、手工小组、合唱队，再和这些的负责人聊一聊，开一个共识会。有的小区有业委会，居民委员会，会做一些接触，再在小区里做一些工作。
大学其实比较简单。我们主要是和社团合作，一般都有环保的，由他们去主导去找学校的团委、校会、楼管或食堂负责人。

（你们会提供技术支持）
对，我们就是一些建议，如果做讲座、印材料的话，我们可以提供一些资源。
高校比较简单。但中学做选修课这块比较困难。首先我们要借助各种手段，网站、微信或其他 NGO 去发布招募通知去找到合适的学校和老师，或者我们已经有资源的校长老师，我们回去找他们谈，如果他们有兴趣，我们就去做一些活动。或者有些感兴趣的老师，他很感兴趣，也能直接开课，我们就让他来参加我么的培训，自己回去开课。

（现在已经有三个焚烧商，我看他们的规划是两年内盖了十二个，你怎么看？）
这个是一个整体。我们在倡导垃圾分类的同时肯定会关注后端的处理。当然有些组织不是很关注这个问题，但 ZZZZ 是很关注这个问题的。因为在政策建议上面，焚烧肯定是我们的重点工作。不管是国内还是国外，香港台湾日本美国各个方面焚烧都不是一个好的选择。从国内情况来看，一个焚烧的处理量非常大，从政府角度来看可以拉动内需。因为它非常贵，政府会花很多的钱，政府喜欢花更多的钱去推动经济增长。焚烧厂和政府还有一些经济利益的挂钩，就某个地方政府来说，这是件非常利好的事情，因为国家、中央政府会给地方很多的补贴，中央政府整体是支持焚烧技术在中国的发展，因为我们国家现在是没有地方可以填埋垃圾了，政府会觉得焚烧是目前我们的出路。

（但焚烧之后也是要填埋的）
但那就减量百分之九十了。
就是中央是支持焚烧这个精神的，所以中央会给地方拨款，地方非常希望自己那儿会有焚烧的设施，这样他们就有钱了。就可以从中央财政那儿拿钱了。

（是除了上网电价的优惠，还有资金的支持吗？）
对，这个有点复杂了，因为现在建焚烧厂大部分是 BOT，build-operate-transfer。

（但是有中央政府对地方政府的支持吗？）
有啊。

（在北京做焚烧的企业是国内国外，国有还是……）
技术是国外的。可能是合作。
从企业本身来讲，希望能拿到更多的电价补贴，进场补贴。进场补贴就是你处理一吨垃圾，政府会补给你一笔钱。

（这个是运来垃圾的企业会付他处理费，政府还会……）
会付他处理费，政府还会补贴，电费啊。进场补贴是有的，但不确定是给焚烧厂还是运来垃圾的人。所以焚烧厂是希望能烧更多的垃圾。从政府来讲，因为焚烧的量非常大，垃圾就有地可去了，就没有垃圾围城的压力，在垃圾分类的问题上就没有那么大的动力去推行。而且现在烧的都是混合垃圾，他可能觉得也没必要垃圾分类那么痛苦。因为现在国内垃圾分类推行的很痛苦、很艰难。各个方面的原因，包括焚烧厂本身的监管，可能不达标排放，包括废灰和底泥的处理很有问题，flying ash 是要当危险废弃物处理的，但这部分处理我们发现很糟糕。之前我们在房山一个危废处理厂，发现这个飞灰堆在一个大坑里面用东西盖着，这真的是太可怕了，处理的很堪忧。这个垃圾含水量很大嘛，就要不断地喷助燃剂。而且要保持这个温度在九百度以上，二恶英才会少，但实际上温度是动态的，会经常往下降，就要经常喷助燃剂。如果不喷就会出问题。而且助燃剂是要钱的，对于焚烧厂很可能出问题，这个我们很担心。就算现在技术达到了，比如在焚烧的时候二恶英能达到多少，但真正实施的时候……

（北京这样的政策，你们选择怎样的战略做对应）
我们主要解决方案，后端肯定还是你要处理的，既然现在没地填了的话，焚烧可能还是要用的，但是我们肯定不鼓励这种处理方式。我们倡导的是前段，通过 3R 这种阶段的减量方式，首先减少消费、循环利用，再提高回收率，让垃圾变少，之后再在充分分类、循环利用的基础上做末端处理。其实我们推得还是前端减量，去分类回收，资源循环利用。这个循环利用很大部分时湿垃圾的资源化，再变成资源。像落叶这些，现在落叶都去焚烧厂焚烧了其实是很浪费，我们的土地非常贫瘠，空气里面二氧化碳过剩，把长出来的叶子、种出来的菜去填埋和焚烧是很不理智的事情。在 organic 资源化上面是很大的重点，也是为什么我们主要说的是干湿。

（落叶一般是环卫队清洁的，会单独分开吗？）
落叶清扫时单独分开的。在使馆区旁边的落叶一路上都是像垃圾一样放在黑色的袋子里，我们觉得很可惜。

（到现在是按照垃圾的方式来处理的，没有任何进展？）
对，填埋焚烧，很简单。

（你们 NGO 推的是把落叶单独回收）

资源化，其实就是堆肥。

（那需要前端设立单独的收落叶，单独运送……）

其实现在就是单独收的，单独运送的。我们的园林垃圾是走单独线路的。不是跟城环垃圾一起走的。

（总之现在还和普通垃圾一样。）

Sample Questionnaire – Semi-structured Interviews – NGO

Broad Area	主题 Theme	问题 Questions
基本信息 Basic Information		• What is your title? 你的**职位**是什么？ • What are your **tasks** in the organization? 你**主要从事**什么工作？ • **How long** have you been working in your organization? 你在你所在机构中**工作多久**了？ • What is your **background**? 你的**教育和工作背景**是怎样的？
组织 Organisation	*活动* *Activities*	• Could you **briefly introduce** your organization? Which is its legal status? 能简要**介绍一下**你所在的机构么？它的**法律地位**是怎样的？ • What are the major **activities** of your organization? Why? 你所在机构的**主要活动**是什么？ • Does your organization publish **annual reports** of its activities? Are they accessible online? 你的机构是否发布**年度报告**？能否在线下载？ • Are there any **other NGOs** of the same type as yours? Which are they? 在国内是否有像你们这样的**其他 NGO**？如果有的话你能介绍一些吗？
	组织结构和发展 Organisation Structure and development	• How many **people** work for your organization/department? 你的机构里有**多少员工**？ • What kind of **background or qualification do your colleagues have**? 你们机构的**员工教育或工作背景**是怎样的？ • How and why did your organization start? And why did you start to pay attention to e-waste? 你的机构是如何/为何开始发展起来的？为什么开始关注电子废弃物？ • Which are your main collaborations with **public bodies**? Which public body? 你们与政府部门有什么样的合作关系？如果有的话是哪些政府部门？ • Does any public body **control/monitor** your activities? 是否有政府**部门监管**你们的工作？ • Does your organization benefit of any **public program**? 你们的机构是否受益于某些**公共项目**(e.g.资助/以旧换新/家电下乡/家电补贴)？ • Which activities does your organization promote to **raise the attention** on specific subject and influence policy-makers? What about e-waste? 你们的机构是否有**吸引舆论关注与影响决策者**的特定活动？在电子废弃物领域呢？

公私合作 – 电子废弃物管理系统（EMS） E-waste management system	*定义* *Definitions*	• Do you think it correct to define the e-waste management system (EMS) in your country/region/city (in Beijing and in China) as a **PPP**? 你认为中国（北京）的电子废弃物管理系统是否能被称为是**公私合作**？ • Have you ever been **involved** in any PPPs project before? 你是否**曾参与过**公私合作项目？ • What do you **think of cooperation** between public and private sectors in general? 总的来说你**怎么看**这种公私合作关系？
	法律 Legislation **设计** Design	• Could you tell me which **laws or regulations** related to e-waste management in your country/region/city have the biggest impact in the current structure of the EMS? 你认为国内（北京市内）哪条电子废弃物管理的**法律法规**对现行体系的结构影响最大？ • What are the major changes introduced by **new legislations** and how does this affect your organization? 你认为**最近实施的法律**(e.g.废弃电器电子产品回收处理管理条例 2011, 处理基金征收使用管理办法 2012)对电子废弃物管理带来了什么主要影响？这对你所在机构又有什么影响？
	本地因素 Local factors	• In your opinion, which **major factors**, during the legislation process, influenced the most the design of the EMS? 你认为在立法阶段影响电子废弃物管理的机制设计的**主要因素**有哪些？ • Do you think that the EMSs have been shaped by aspects of **geographical context** such as history, political and economic system, influence, public intervention, social and cultural factors, legal framework and concern with social issues? (e.g., how EMSs in your country differ from EU systems). 你认为电子废弃物管理系统是否受到历史、政治经济系统、公众干预、社会文化因素、法律框架等的**本地化因素**的影响？（e.g.你认为中国的电子废弃物管理系统与欧盟有何差异？）
	主体，角色 *Actors, Roles* **主体&设计** Actors and Design	• Which are the **main actors** involved in the EMS in your country/region/city? Public/private (companies)/stakeholders (ENGO, charities, informal sector, etc.). Could you tell me how **roles** are distributed between these? 你认为中国（北京）的电子废弃物管理系统中的**主要参与主体**有哪些？公共部门，私有部门，非正式系统，环境NGO，慈善机构
	主体 本地/全球因素 Local/Global actors	• 等等。你认为这个系统中这些主体有怎样的**分工**？ • Could you tell me which are the main actors involved in the **collection** of WEEE in your country/area/city? Do you have any relationship with them? 中国（北京）的电子废弃物**回收**有哪些参与主体？你与这些主体之间是否有联系？
	主体 本地/全球因素 Local/Global actors	• Could you tell me which are the main actors involved in the **treatment** of WEEE in your country/area/city? Do you have any relationship with them? 中国（北京）的电子废弃物**处理**有哪些参与主体？你与这些主体之间是否有联系？
	主体 公共部门的参与 Involvement of the public sector	• Are there in your country/region/city (Beijing and China) **any charities or NGOs** participating at any stage of the e-waste management? What is your opinion? Does your organization have any relationship with them? 就你所知,中国（北京）有任何参与电子废弃物回收、处理和管理的 NGO 或者慈善机构吗？你怎么看这些 **NGO/慈善机构**？你与这些机构之间是否有联系？
	主体&设计 Actors and Design 任务分工 Division of tasks **领导力** Leadership	• What is your opinion of the **informal sector** in your country/region/city (Beijing and China)? 你对中国（北京）的**非正式**部门怎么看？ • In your opinion which is the **central actor** in the decision-making process in the EMS in your country/region/city (Beijing and China)? 在你看来，中国（北京）EMS 的决策过程中**核心的参与主体**是哪个？

	责任 Responsibilities **问题类型** Problem Type 概念明确性 Clarity of problem description **设计** Design 开放度与包容性 Openness and Inclusion **问题类型** Problem Type 成本收益的均分 Benefits **问题类型** Problem Type 原则的兼容性 Values **问题类型** Problem Type 利益冲突 Conflicts	• Have you ever heard of the concept of **Extended Product Responsibility**? How would you define it? What is your opinion on it? 你是否知道**生产者延伸责任制**这个概念？你如何界定这个概念？你对这个概念有什么看法？ • Do you have regular **collaborations/meetings with** the stakeholders? Can you participate in any way in the decision-making process of other actors? 你与其他利益主体之间是否有固定的合**作与联系**？你是否可以参与到其他主体的决策过程中？ • In your opinion, is there equal spread of **responsibilities, risks and benefits** across participants? 在你看来，EMS 系统中的这些参与主体是否平等地分担了**责任、风险和收益**？ • In your opinion is there **compatibility of values and interests** between the actors involved? 在你看来，这些参与主体间**利益与原则**是否兼容？ • Do you think that there is any **conflict of interest** that involves your organization? 在你看来，你在这个系统中是否有相互冲突的**利益**？
影响和结果 Impact and Results	*标准 Standards of Reference* **目标完成度** Goal attainment or compliance **目标完成度** Goal attainment or compliance **影响** Impact 经济/社会/环境 Economic/Social/ Environmental **影响** Impact 经济/社会/环境 **优化** Optimum	• What is **your general opinion** on the current EMS in your country/region/city (Beijing and China)?总的来说你怎么**评价**中国（北京）现行的 EMS 系统？ • In your opinion, which are the main **achievements and failures of the current EMS**? 你认为现行的 EMS 系统有哪些**成就和问题**？ • To your knowledge, did the implementation of the system have any **social or environmental impact**? E.g. unemployment rate, environment degradation, etc.?你认为这个 EMS 系统的实施是否有任何**社会的和环境的影响**？e.g. 失业率，环境质量下降等。 • In your opinion, what was the impact of the establishment of EMS on **charities** and on **informal economy** in your country/region/city (Beijing and China)? 你认为中国（北京）现行 EMS 系统对**慈善机构**和**非正式部门**有什么影响？ • What is your opinion concerning an hypothetical situation **without the involvement of private actors** in decision-making processes of a formal EMS? 如果现行的正规 EMS 系统在决策过**程中没有私有部门**的参与将会变成什么样的结构？ • In your opinion, which was respectively the **influence** of public, private and other stakeholders in the implementation of EMS? 你认为公共部门、私有部门和其他相关利益群体对 EMS 的实施各有什么**影响**？ • What do you think is the major **contribution** of each actor involved in the current EMS? 你认为这些主体对现在的 EMS 各自有什么**主要贡献**？ • What things would you **improve**? 你认为现在的 EMS 应该如何**改进**？

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