Urban Harvest: Recycling as a Peasant Industry in Northern Vietnam

by Michael R. DiGregorio

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During my first visit to Hanoi in 1988, I was struck by the evident cleanliness of the city. In contrast to my expectations, based on memories of the squalor of wartime Saigon, Hanoi, despite its incredibly dense population, was remarkably clean and neat. On early-morning jogs and late-evening strolls, I was impressed by the large number of city sanitation workers, virtually all women, engaged in sweeping the streets and pushing carts loaded with trash to central collection points. My questions to Vietnamese colleagues about the way this system functioned were met with shrugs. They simply took the presence of this amenity for granted and did not wonder about its internal organization. Now, in a truly pioneering study, Michael DiGregorio has provided us with an impressively detailed description of Hanoi's solid waste management system. Of special interest is his account of the complex organization of collection and recycling of a wide range of waste items, not just the expectable paper, bottles, and aluminum cans but also wire scraps and animal bones. This recycling system, which flourished while Vietnam had a largely autarkic domestic economy that functioned, to the extent it functioned, in almost total isolation from the global market, is now threatened by surging imports of cheap consumer goods. How Hanoi's waste-recovery system will respond to new market forces is an unanswered question.

DiGregorio's monograph goes beyond technical description of the urban solid waste management system to explore how that system is embedded in the larger peasant social system of the Red River Delta. Transcending the conventional perception of urban and rural as distinct and separate systems, he traces some of the manifold connections between Hanoi's waste management system and the peasant villages of the delta. As his title suggests, when viewed from the per-
spective of the delta peasants, the rubbish dumps of Hanoi are simply another set of fields to be gleaned by those who can arrange access to their rich resources. Building on Pierre Gourou's earlier analysis of the northern Vietnamese rural economy, he shows how the structure of peasant participation in the collection of urban wastes in contemporary Hanoi resembles the organization of the hundreds of specialized handicraft industries that characterized the villages of the delta during the colonial period.

Something should be said about the way in which DiGregorio accomplished this study since it is neither easy nor simple for foreign scholars to conduct such research in Vietnam. The key to his success was his ability to integrate himself into a Vietnamese research institution—the Center for Natural Resources Management and Environmental Studies (CRES) of Hanoi University—and to plan and carryout his work in close collaboration with CRES staff. DiGregorio had the advantage of being able to build on strong preexisting ties between his sponsoring institution—the East-West Center Program on Environment—and CRES, but the success he achieved is a reflection of his own ability to win the confidence and enthusiastic cooperation of his colleagues at CRES. Having had the opportunity to directly observe his team at work, I recognize the strength of the sentiments embodied in DiGregorio's generous acknowledgments of the contributions made to this study by his Vietnamese collaborators, notably Ms. Phuong. Collaborative work by Americans and Vietnamese can be very difficult but, as is demonstrated by DiGregorio's monograph, it can result in a depth and quality of research that would be unobtainable by a foreigner alone. It is my hope that DiGregorio's work will provide a model, both in terms of quality of the research and the methods for conducting it, that will become the norm for environmental studies in Vietnam.

A. Terry Rambo, Director
Program on Environment
East-West Center
Scavengers fill a unique place in the life of cities, a place that crosses both the physical boundaries of cities themselves and the disciplinary boundaries of those who attempt to interpret their presence in the fabric of urban life. Most are poor. Many are migrants. Some enter the trade as a refuge from destitution. Others enter through caste, village, or household custom. Some work alone, directly appropriating use values from an urban nature. Others operate under economic pressure, appropriating only those resources for which there is a market. As a group, their collective activities provide an often-ignored ecological service. Despite this, their work may be viewed as a nuisance by state agencies, an embarrassment by local governments, and an expression of dehumanization by social activists.

I came to the subject of scavengers and scavenging through three separate, but intersecting, routes. The first route, the environmental path, was opened to me in the summer of 1990 through an assignment to collect, analyze, and compile journal and newspaper articles on environmental problems and environmental movements in Asian cities. The most notable aspect of this research was the near absence of reports on urban environmental conflicts versus the preponderance of reports on their rural equivalents. The latter most often involved a defense of livelihood against the state, capital, or both, by communities, however riddled by their own internal conflicts, that had established claims to particular resources. The practices of these communities, and their conflicts with the state and capital, were pictured as a battle between dominant development models and alternative, sustainable approaches. Environmental conflicts in urban areas, however, were most often framed in sectoral and technical terms, as unintended consequences requiring mitigation, unconnected to livelihood struggles.
There was, however, one clear exception to this rule. In nearly every major city in Asia, conflicts were unfolding as rationalization of waste management expanded areas of state control into the economic terrain held by scavengers and junk buyers. The scattered stories and photographs of forced evictions from dumpsites that infrequently appeared in regional newspapers were the most visible evidence of this conflict. Much of the commentary on these evictions focused on the poverty and dehumanization under which scavengers lived. Equally, many reporters were surprised by the resistance of these communities to resettlement. Only in time did I come to see this resistance as an urban equivalent to rural resource conflicts.

A second line of thought began with a challenge by Dr. C. Michael Douglass to examine my assumptions regarding the informal sector. This examination (Chapter 2 of this volume) introduced me to Birkbeck's study (1978, 1979) of scavenging, and through it, the complex social relations that regulate much supposedly informal work. As I picked through the literature, my own thoughts drifted from articulated modes of production, which I have come to accept only as a heuristic, to a more satisfying view of economy as embedded in the multistranded relationships of everyday life.

Finally, the third train of thought coalesced within an assignment to investigate work and poverty in urban Asia. Like my readings on the informal sector, the issue of poverty once again reinforced notions of social regulation, adding to this gender, caste, ethnic, religious, and other forms of discrimination. My conclusions focused on the role of the state and upper circuits of capital in reproducing poverty generation after generation, principally through periodic confiscation of assets (such as the demolition of noncomplying housing areas or harassment of street vendors), systematic exploitation of women's labor under the ennobling guise of development, debilitating credit relationships, and control of urban resources. Induced development, however conceived, thus appeared as a double-edged sword, rewarding those best posi-
tioned and best prepared, and marginalizing those without such access and preparation.

In the end, my reflections on these three areas—the environment, the social organization of economic life, and urban poverty—all converged on a single group of people, urban scavengers and junk buyers. The question that remained was how to enter this study.

Recent literature on scavenging has generally focused on the administrative and technical issues required to rationalize the process of solid waste recovery in which scavengers are a part. In this vein, scavenging has been promoted as a source of employment, a low cost supply of industrial inputs, a conserver of resources, and a method of diverting wastes from landfills. Underlying this model of incorporation is an assumption that the "informal" and "unregulated" activities of scavengers can be incorporated into state structures and that scavengers will benefit from this incorporation. One problem with this approach is that scavenging is often treated as a function and not a profession linked to real people. As a result, many programs intended to bring scavengers into regulated environments, as, for example, proposals to allow scavengers only at municipal recovery facilities, do not incorporate actual scavengers but rather overlay a new population.

Another group of researchers, as advocates of the poor, has taken on the promotion of scavenging. While these writers also recognize the ecologic benefits of waste recovery, they tend to see scavenging less as a benefit to society and more as a right to livelihood. Thus, rather than viewing scavenging as benefiting from incorporation, they frequently view the actions of the state as undermining the ability of scavengers to care for and advance themselves.

Finally, a few writers have entered into the subject of scavenging through political economy. For these writers, scavenging, both literally and illustratively, is a profound example of the exploitation and human degradation brought about by capitalist development. Although less concerned with ecol-
ogy and more concerned with social relations than some would have, these writers have made important contributions to an understanding of the roles of hierarchy and dependency in the urban economy.

This paper will enter into the debates generated by each of these research streams, applying both an analysis of the relevant literature and a case study of Hanoi, Vietnam, to the questions they pose. It assumes that issues of society, economy, and ecology are interwoven and that, though each can be viewed separately, solutions to problems such as social dislocation, economic inequity, and environmental degradation involve a perspective that encompasses all three.

The main body of this paper is organized in five chapters. Chapter 1 provides an overview of the literature on scavenging across a range of representative urban contexts. Chapter 2 describes and criticizes common frameworks used to analyze private, labor-intensive, waste-recovery systems and the means by which they are inserted into the urban economy. Chapter 3 provides a case study of waste recovery in urban Hanoi. Chapter 4 analyzes Hanoi's recovery system in light of the previous chapters and historical precedent. Chapter 5 examines processes of continuity and change within the recovery industry and forecasts potential futures.

Michael R. DiGregorio
Program on Environment
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This paper was originally submitted in partial fulfillment of a master's degree in Urban and Regional Planning at the University of Hawaii. I owe a debt of gratitude to my faculty and East-West Center advisers—Dr. C. Michael Douglass, Dr. G. Kem Lowry, Dr. A. Terry Rambo, and Dr. Yok-shiu F. Lee—for their support and direction in pursuit of that degree. While I alone am responsible for errors and omissions, I acknowledge their influence in the choice and direction of this research. Much of what I have written is a reflection of what they have taught me.

Fieldwork was funded by the East-West Center Program on Environment and sponsored by the Center for Natural Resources Management and Environmental Studies (CRES) of Hanoi University. I would not have been able to carry out this work without the support of these two institutions. I especially acknowledge June Kuramoto, my program officer at the East-West Center, and the faculty, staff, and students of CRES for their assistance in managing the course of this research and carrying out some of the more tedious details. In particular, I thank Dr. Vo Quy, the Center's director, whose review of my thesis proposal and quick "this is important" created the opportunity for this research, and to Dr. Le Trong Cuc, the Center's deputy director and my fieldwork adviser, whose oversight and attention kept me on track and on schedule. My counterpart at CRES, Nguyen Thu Phuong, also deserves credit for carrying this research through its course. Phuong's earnest and capable efforts not only smoothed our way through a dense schedule of interviews but also steered us clear of potentially difficult social situations. Her astute observations of both the content and the context of these interviews and situations provided an invaluable service in developing our understanding of social relations within the recovery industry.
In addition to Dr. Quy, Dr. Cuc, and Phuong, this research has relied on the goodwill and efforts of many people. Dinh Dang Thuong, our assistant, deserves special mention for countless services. When interviews produced further questions, Thuong was called on to follow-up, privately interviewing workers in enterprises (while Phuong and I interviewed managers) and following up on questions regarding production processes. Students of the Center’s postgraduate course in Environmental Studies administered the survey from which most of the statistical data are drawn. I offer my gratitude to them for taking on a difficult task and carrying it out with a dedication born of a desire to learn (see Figure A.2 for names of interviewers).

The staff of the Urban Environment Company (URENCO), especially Mr. Dinh Dang Minh, contributed much to this research. URENCO’s open-door policy allowed me to visit facilities, interview staff, and access research files when and as needed. Mr. Do Long Giang, chairperson of the O Cho Dua ward People’s Committee, also contributed to this project, introducing me to recyclers and recycled materials users in his ward, answering my questions on local history and historical relationships, and allowing me access to ward records.

Dr. Yok-shiu F. Lee (East-West Center) and Dr. Joseph Whitney (University of Toronto) reviewed an earlier draft of the manuscript. Their useful comments and suggestions for revisions have greatly assisted me in producing this version of the paper. Final editing was done by Helen Takeuchi, senior editor of the Program on Environment.
This research was conducted in Hanoi between June 6 and September 12, 1992. Investigation was carried out through a multilevel strategy, including reconnaissance, unobtrusive observations, structured and open-ended interviews, and a standardized survey (see Appendix A for research methodology).

Reconnaissance, which began shortly after my arrival in Hanoi, initially involved daily early-morning bicycle tours through the city. These bicycle tours were used to test preliminary assumptions and to make initial assessments regarding the spatial and temporal distribution of the trade. As the research progressed, staff at the Center for Natural Resources Management and Environmental Studies of Hanoi University also became involved in reconnaissance work, scanning local newspapers and news magazines for articles related to recycling and waste management.

Initial reconnaissance led to the identification of areas and situations where unobtrusive observations could take place. Often, these observations involved nothing more than quietly sitting with a street trader, answering the trader’s questions but offering very little in return. At other times, these scenarios required sitting near a material source, observing both the methods and periodicity of collection. To these observations were added telephone calls to various manufacturers to identify an appropriate spectrum of recycled materials users.

When the parameters were understood, interviews were arranged across the spectrum of refuse and recovery activities. Among these were frequent discussions with Urban Environment Company personnel and observations of work at each of its divisions, visits to local recycled materials-based manufacturers, and discussions with recycled materials buy-
ers and dealers. Many of these interviews have been incorporated into case studies within the text; others are contained in Appendix B.

Only after the basic contours of the system became evident, about six weeks into the research, did we attempt a standardized survey. The survey was thus tightly designed to confirm or refute observations, particularly the locality-trade relationships evident from our interviews. Data, tables, and charts were drawn from this survey. Detailed tables are provided in Appendix C. The survey instrument is reproduced in Appendix D.
Scavengers and Scavenging

This chapter provides an overview of the literature on scavenging. It is organized as a search for answers to three basic questions: (1) what is scavenging? (2) what are its organizational and structural characteristics? and (3) why is it worth investigating? In brief, this chapter will contend that scavenging is an occupation, a broadly defined labor process and an industry that, though almost universally disparaged, provides important ecologic and economic benefits. It is, nevertheless, an occupation of the poor and subject to the conditions of insecurity and limited access that define many poor people's trades. It will argue that the state, through direct and indirect policies, is partially responsible for both the production and alleviation of these conditions.

Scavenging can best be conceptualized as an occupation, a broadly defined labor process and an industry, each of which successively incorporates a wider range of activities and a larger number of people. Whether at the lowest level in the recovery hierarchy or the highest, each level shares two common characteristics of the trade: a recognition of waste as an economic resource and a varying degree of social opprobrium. While the former characteristic separates workers in the waste-recovery system from those employed in the municipal refuse system, the latter extends to both. Refuse workers, however, are generally buffered from the full force of this stigma through the use of intermediary technology or association with the state and its authority. Waste recoverers, especially those at the bottom of the hierarchy, are afforded no such buffers. As those who directly handle wastes, they
are linked to wastes and face the full force of social taboos associated with wastes.

This opprobrium is nowhere distilled to such a degree as in the word “scavenger,” a term applied in this chapter and throughout this paper to an occupation that involves the collection of discarded materials from public and quasi-public spaces for future sale or occasional use. “Scavenging” will be used to define the labor processes involved in the initial collection, purchase, and processing of recoverable materials. The industry supported by scavenging will be called the “recovery system” or “recovery industry” and held in contrast to the “refuse system,” a term reserved for waste collection and disposal for sanitary (ecologic) purposes.

SCAVENGING AS AN OCCUPATION

The English term scavenger, commonly used to describe those involved in the direct production of commodities from wastes (Sicular 1989; Baldisimo, Lohani, and Evans 1988; Versnel 1982), has a variety of historical and contemporary meanings. The term first appeared in the thirteenth century as the title of municipal employees charged with collecting tolls from nonresident merchants. Although those forced to pay these tolls may have regarded scavengers in a particularly negative light, direct association of the term with the stigmas surrounding waste or waste collection did not appear until the mid-sixteenth century, when the duties of municipal scavengers were expanded to include keeping streets and market areas free of debris. When the toll-collecting responsibilities of scavengers were eliminated shortly thereafter, only these cleaning duties remained.

Thus, placed in a new context, the term was rapidly applied to all those occupied with removing wastes under contract. This definition remained well into the late nineteenth century when licensing of scavengers to collect waste along city streets and other public places in exchange for exclusive rights to income derived through these sources was a common method of municipal waste management (Melosi
Modern English usage, separated from the historical roots of the term, derives much of its import through the derogatory relationship between scavenging, wastes, and carrion feeders. This association, which began in the late sixteenth century, is now imbedded in the language and makes it difficult to speak of scavengers without an unspoken association of the trade with detestable things.

The English language is not alone in debasing scavengers through both word and sentiment. Scavenging is almost universally disparaged. Residents around Cali, Colombia's dump, referred to scavengers as “vultures” (Birkbeck 1979). In Mexico City, dump scavengers were referred to as “flies” (Bubel 1990). In Tokyo, resident buraku were referred to as
"ants" (Taira 1969). Yet even in countries such as Vietnam and Indonesia, where local occupational terminology is not directly derogatory, society has linked the occupation with human degradation and, possibly, criminality (Rebong and Ekna 1979; Versnel 1982).

This link is so much a part of conceptualizations of the trade that Sicular has concluded that the occupation inherently bears a social stigma that is "both a precondition and result of that occupation" (Sicular 1989, 10). He elaborates on this statement by quoting Blincow (1986) in concluding that scavengers tend to come from low-status groups like "gypsies, immigrants, heretical religious sects, semi-criminal elements, untouchables and other low castes" (Sicular 1989, 17). In so doing, he associates scavengers with all those whose access to employment is restricted due to racial, religious, social, or political repression. He supports these assumptions with comments on the life histories of various members of the scavenging community at Jati Dua, his research site in Bandung, Indonesia. Many of the scavengers living in the Jati Dua were migrants from rural areas and a few, especially those in patron positions, had criminal histories. Rebong and Ekna (1979) reached similar conclusions on the social position of scavengers, beginning their review of scavenging in Jakarta with a description of Sum, a prostitute, and Karyo, her shack mate, a scavenger.

Although more reflective of stereotypes than actual evidence, comments like those offered by Sicular, Blincow, Rebong, and Ekna underscore the negative standing of scavengers within society. This negative standing is only partially rooted in the social preconditions of the work. The second source of stigma, which extends to those who share none of the characteristics outlined earlier, is derived from the association of scavengers with wastes. Because scavengers directly handle wastes, they are subject to the taboos associated with wastes.

Unlike public refuse workers, scavengers are neither buffered from direct contact with wastes through an intermediary technology nor do they gain limited status through
affiliation with a public institution. Their only association
is with waste itself. This association results in a social equa-
tion where scavengers are relegated to the status of the ma-
terials they handle. Far from being unaware of this associa-
tion, many scavengers attempt to avoid it by covering their
faces while working, attempting to be unobtrusive, and at-
tempting to maintain culturally acceptable standards of dress
outside their work (Sicular 1989).

While the general public may associate all those who
handle waste with waste itself and vary their opprobrium
based on the source of authority and form of technical me-
diation, within the waste trades there is a deeper distinction
based on how those employed perceive wastes. Refuse work-
ners have as their primary duty the collection of wastes for
disposal. Although they may remove valuable materials from
the waste stream for later sale, their primary relationship to
wastes is one of waste as refuse (Sicular 1989).

Scavengers are not refuse workers and are not intrinsi-
cally concerned with waste management (Birkbeck 1978).
They enter into the trade for economic reasons, and their
relationship with wastes is one of waste as resource. Unlike
refuse workers, whose ecologic duties obligate them to col-
lect all wastes regardless of value, scavengers, who operate
under economic pressure, only collect those materials for
which there is a market or which they can directly consume.

The labor process involved in this collection is based
on a use of public and quasi-public spaces, such as dumpsites,
refuse bins, roadways and refuse carts, as a source of recover-
able materials (Sicular 1989). Scavengers freely collect from
these sources where possible and make arrangements with
the guardians of these sources where necessary. Arrangements
that secure access include labor-sharing agreements and agree-
ments to contribute rent or to purchase materials. Specifi-
cally, scavengers may cooperate with refuse workers, keep-
ing transfer depots tidy and performing routine tasks like
unloading trucks, in exchange for rights of access (Sicular

In other cases, they may be forced into paying munici-
pal employees, territorially based gangs, or social superiors for the right of access (Vogler 1981; Sicular 1989; Baldisimo, Lohani, and Evans 1988; Haynes and El-Hakim 1979). This payoff is especially true of those working at municipal dumps. Finally, scavengers may also be financially bound through agreements that require sale of all or part of their collections to specified traders.

These arrangements are often tempered by mutual assistance based on ethnic, caste, or communal relationships. Sometimes called the "economy of affection" (Williams 1987) or the "moral economy" (Scott 1976), these relationships provide for a minimum subsistence, access to resources, and a mechanism for the transfer of surplus. In some instances, these relationships cross ethnic or caste boundaries, though this is generally not the case.

In most instances, some form of common social affiliation forms the basis for organization. This may also involve the assistance or patronage of social equals and superiors working in municipal sanitation companies (Furedy 1984) or local government. Such arrangements provide a reserved economic niche for affiliated scavengers and traders. While the moral economy of such systems does not overrule exploitation, it provides mutual support not common among solitary or isolated scavengers.

SCAVENGING AS A LABOR PROCESS

As a broadly defined labor process of gathering, purchasing, processing, and transporting waste materials for sale or personal use, scavenging encompasses a wide range of activities undertaken by a number of different occupational groups. Scavengers have already been mentioned. Others involved in scavenging include foragers, itinerant junk buyers, municipal refuse workers, and the low-level traders of recovered materials. Although each of these groups shares important characteristics, especially in their relationship to wastes, they differ in their social standing, motivation for work, and relation to capital.
These distinctions are not always apparent in the literature on scavenging. All too often, foragers, scavengers, junk buyers, municipal refuse workers, and small traders are grouped under the term “scavenger.” This is evident in Blincow’s analysis (1986) of the labor process. He delineates four types of “scavengers” based on employment characteristics and relation to waste materials: the destitute who rummage for direct consumption, the self-employed producers of commodities from wastes, wage laborers employed in private or public enterprises, and owner-workers who are members of recycling cooperatives (p. 99). Baldisimo, Lohani, and Evans (1988) continue in a similar vein but restrict their typology to “independent entrepreneurs” like traditional rag and bone men, dump scavengers, and public or private refuse collectors who retrieve salable materials as an adjunct to their primary work (Baldisimo, Lohani, and Evans 1988, 4).

Although valuable in drawing attention to the many activities and labor situations included in scavenging (the labor process), these occupational typologies group people with vastly different employment characteristics and mask distinctions within occupations. Specifically, foragers, the destitute who rummage through wastes mostly for personal use or consumption, are only peripherally connected to the recovery industry. Although their activities are similar to scavengers, their motivation is different. Rather than working under an economic pressure built on demand for recovered materials, foragers operate under the strict discipline of survival. Because they are often solitary and disheveled, foragers embody many of the social stigmas associated with handling wastes and may, in fact, typify scavengers among members of the general public.

Municipal refuse workers, on the other hand, receive both a degree of status and a stable income through their employment with the state. Furthermore, rather than relying on wastes for the bulk of their income, municipal refuse workers supplement their income through the collection and sale of materials from the waste stream. Their access to waste sources allows them to freely collect those materials with
the highest value. Itinerant junk buyers do not have this option. They must actively seek out and purchase waste materials at their sources before they enter the waste stream and are collected by the municipal workers, scavengers, or foragers who rely on public and quasi-public spaces as their sources.

This distinction in sources divides junk buyers from municipal workers, scavengers, and foragers in two important ways. First, because junk buyers generally collect clean materials they face less of the social stigmas associated with the trade. Second, because they must purchase the materials they collect, they have a different relation to capital. While this relationship, through the extension of credit, allows junk buyers to specialize in higher value materials, it may also bind them to the small traders who serve as conduits to upper circuits of the recovery industry.

Relationships within and between the upper and lower circuits of the recovery industry are illustrated below (see also Figure 1.1). Functionally, the lower circuit corresponds to the labor process of scavenging, while the upper circuit corresponds with the labor processes involved in processing and trading. Although the degree of separation and integration between the two circuits varies from place to place, the

\[Figure\ 1.1\ Upper\ and\ lower\ circuits\ within\ the\ recovery\ industry\]
role of small traders and municipal workers generally does not. Municipal refuse workers bridge both circuits though they are themselves largely outside the system. They receive a stable income from regular employment and are involved in the recovery system largely through supplemental income-earning activities. Small traders, on the other hand, clearly straddle both circuits, serving as conduits for materials produced in the lower circuits and, since many share social characteristics with others in the lower circuit, as mediators in the transfer of surplus.

The degree to which small traders fill these functions largely depends on the degree of organization imposed by traders and industrial users in the upper circuit. This imposition varies from one society to the next though, in the most general terms, the intersecting, two-circuit structure in which small traders play a pivotal role in funneling materials upward and relaying price ceilings below is a standard grammar of recovery systems in industrializing urban contexts. Where this structure is strong, those in the lower circuit are unable to accumulate sufficient surpluses to move beyond daily subsistence and may, in fact, be increasingly "squeezed" as competition in the upper circuit forces prices down for recovered materials [Birkbeck 1979]. The state participates in this process of impoverishment through its urban development policies, which, with a fairly high level of consistency, force those in the lower circuit to expend their hard-won assets through evictions and through the rent-seeking of civil authorities.

Most of the literature on scavenging contains elements of this typology. The lower circuit, in both its core and periphery, is composed of all those termed "scavengers" by Blincow [1986]. Furedy [1990] uses a similar typology, though she refers to scavengers as "waste pickers" and makes the important distinction between an itinerant population and those settled on dumpsites. Both Birkbeck [1978, 1979] and Sicular [1989, 1991] make the same distinctions, though both fail to distinguish foragers from others involved in the recovery system. Nearly all writers on the subject, including
Birkbeck and Sicular, consider junk buyers as an occupationally distinct group.

On the whole, the picture that emerges from the literature is one of a complex system involving numerous and distinct occupational groups fulfilling various and often multiple roles. Nevertheless, both Sicular and Birkbeck, the major analysts of social relations within the recovery industry, have chosen to strictly focus their studies on one particular set of relations within this complex structure, that between scavengers, small traders, and the upper circuits of the recovery hierarchy. One reason for this reductionism is ideological. Scavengers, at the lowest rung of the waste-recovery hierarchy, are, the most insecure, the most vulnerable to exploitation, and the least capable of accumulating wealth. As such, they are fertile ground for the study of exploitative relations of production within urban capitalism. Itinerant junk buyers, also members of the core recovery workforce, do not easily fit into this framework. While junk buyers are equally susceptible to exploitation, their risks come directly through the need for working capital. As such, they do not easily fit into the framework of "disguised factory labor" proposed by Birkbeck (1978, 1979) nor do they match the qualifications of a "non-capitalist form of production" espoused by Sicular (1989, 1991). Furthermore, the omission of junk buyers from the analysis of productive relations within the recovery industry has led both Birkbeck and Sicular to false conclusions regarding the impacts of technical change and capital investments on the recovery of waste materials and the livelihoods of those involved. Specifically, since only scavengers collect waste materials exclusively from public and quasi-public sources, only scavengers would be directly and negatively affected by technical changes in the refuse system that result in limited access. Thus, Birkbeck is absolutely right in his conclusion that the future of scavenging (the occupation) depends on a lack of technological change in the refuse system [Birkbeck 1978, 1175]. But it would be wrong to say that technological change would adversely affect all areas of scavenging, a labor process that includes junk buyers and mu-
Scavengers and Scavenging

Sicular's assessment of the future of scavenging in West Java is equally suspect due to its exclusion of junk buyers. Having scavenging conceptualized as a noncapitalist form of production within the capitalist economy, Sicular perceives no internal drive for technological improvement within the recovery industry, but rather, stagnation in the face of continually lowering marginal returns on labor. He is able to do this because he does not factor in junk buying, a labor process that is still a familiar feature of urban waste management in industrialized societies, but rather, focuses solely on scavenging as a temporary doorway for rural migrants into urban society.

SCAVENGING AS THE BASIS FOR AN EVOLVING URBAN INDUSTRY

The recovery industry, the broadest and most inclusive of the three units of analysis employed in this research, is composed of the widest variety and number of actors, occupations, and economic units. Some, like municipal refuse workers and the users of recovered materials, are typically only marginally incorporated into the system. Others, like dealers, agents, small traders, junk buyers, and scavengers, are more directly integrated. The magnitude of actors and specialties involved, along with the changing patterns of waste generation and material needs, allows the recovery industry to be both flexible, in terms of rapidly changing production patterns to meet short-term demand, and adaptive, in terms of incorporating new processes and new materials as markets develop. Such flexibility and adaptability provide the basis for a dynamic and evolving industry.

Development of a recovery industry in any particular city is conditioned on three common-sense factors: there must be a demand for recovered materials; there must be a supply of sufficient quantity and quality; and people must be willing or compelled to enter into low-status and low-paying work (Sicular 1989). That these conditions are periodically met by
all societies should come as no surprise. History (and development) is not a linear, progressively upward movement and thus in the various rises and falls, dissolutions and transformations, scavenging appears, to a greater or lesser extent, as a viable economic niche.

What is obvious, however, is that as supply, demand, labor availability, state intervention, and society's attitudes toward wastes fluctuate over time, scavenging takes on different forms and different priorities. Where agriculture provides demand, wastes are relatively uncontaminated and chemical fertilizers are unavailable or uneconomic, scavenging has primarily involved the collection and trading of human and food wastes (King 1911). Classic examples of this phenomenon appear in the history of waste management in China, Korea, and Japan, where human and vegetable wastes were recycled into suburban agriculture and aquaculture in a process that both increased fertility of suburban areas and allowed for long-term sustainable use.

Although primarily a response to demand for fertilizer, these systems provided an ecologically benign means of managing human and other organic wastes. Their demise has largely been brought about by the twin processes of market-oriented industrialization and urbanization. These processes generally bring about demographic shifts that create dense urban concentrations, which overload traditional nightsoil-recycling systems and ecosystem capacity, and changes in consumer attitudes toward waste, which result in a reduction of supply, increased contamination of available sources with inorganic and hazardous waste, decline in demand, and increasing use of chemical fertilizers (Whitney 1991).

While market-oriented urbanization and industrialization generally disrupt markets in organic wastes, they also create new markets in materials needed by the emerging urban society. Many of these materials, like scrap metal, glass, and paper, may have been collected and traded in the past. With the increase in postconsumer waste due to changes in consumption patterns, demand for recovered materials as
industrial inputs, and employment scarcity brought about by rural dislocation, solid-waste scavenging generally undergoes its own process of transformation. Industrial demand and new forms of postconsumer wastes alter the volume and types of materials collected, processed, and sold while increasing competition and changes in the urban refuse system alter the organization of the recovery system as well.

Birkbeck’s description (1978) of Cali, Colombia’s recovery system, provides an illustrative example of these changes. In the early 1950s, prior to the large-scale industrial development of the city, scavengers searched for discarded goods—clothing, cutlery, jewelry, and shoes—along the city’s streets and at the municipal dump. The goods they collected were sold to second-hand shops and eventually found their way into low-income households. As the city’s industrial base began to expand, however, a market for materials (rather than goods) developed. Initially this market centered on the collection and sale of large tins and small cosmetic bottles for use by small industries, but as larger industries entered the local and national economy, changing demand turned waste collectors and traders toward the collection and processing of wastes as generic material inputs. By 1976, this later aspect of the trade represented the bulk of recovery activities in Cali. According to Birkbeck, scavengers recovered 7-10 metric tons of paper and carton, 1 metric ton of tin, 2 metric tons of bottles, one-half metric ton of bone, and an unknown amount of plastic each day from Cali’s dump. Nationally, the paper industry drew 16 percent of the total feedstock from scavengers. In Cali, which was a major paper-producing area, Birkbeck estimated that scavengers supplied 15,000 metric tons of waste paper annually (Birkbeck 1979, 17).

Changes in markets for recovered materials brought about a structural change in the recovery industry as well as a change in the type of materials collected and traded. Reliance on materials collected from refuse and concerns for maintenance of a steady supply resulted in the conversion of Cali’s 1,500 to 1,700 largely solitary and independent scav-
Birkbeck’s discovery of a waste-recovery hierarchy has been repeated in many studies of scavenging systems in industrializing countries. In many cases, these hierarchies are reciprocally tied to relations of dependency between clients and patrons. The cornerstone of these relations is the institution of “tying,” a process in which sellers are bound to buyers through credit or other obligatory arrangements. Although these relationships may be through the market, they are not based on principles of economic rationality.

Typically, credit is either extended through usury or negotiated within the context of sales. In the former, the rate of credit is tied to factors other than capital markets, such as the potential risk involved or particular social relations between lenders and borrowers. In the latter, no specific rate is negotiated, though a cost for capital is incurred by borrowers through a systematic lowering of prices for goods received. When the institution of tying is widespread, it combines with the functional hierarchy found in many recovery systems to produce tight networks that limit access and promote accumulation upward. Where these networks have a basis in communal affiliations such as caste, territorial origin, ethnicity, or religion, they are often partitioned into internally regulated niches.

HIERARCHY

On a purely technical level, hierarchy within the recovery industry generally appears as a division of labor and labor processes based on scale and degree of specialization. Collection by foragers, municipal workers, scavengers, and itinerant junk buyers forms the base of this hierarchy. At the lowest level above collection are the small traders that serve as intermediaries between upper and lower circuits. In Indone-
Scavengers and Scavenging

Sia, these small traders, who generally conduct their business on available quasi-public urban spaces such as vacant lots, sidewalks, or rail rights of way, are called depot (lapak) managers (Rebong and Ekna 1979). At the next level of the hierarchy, or at the lowest level where depots are not present, may be other small traders operating out of fixed locations. Because they have secure space, these receivers are capable of stockpiling higher volumes of materials and sorting or processing them with greater specificity.

Above small traders are the various dealers and agents who form the upper circuit of the recovery hierarchy. In situations where the hierarchy is strictly observed, dealers and agents are the farthest removed from waste sources and the least likely actors within the system to be affected by social stigmas associated with wastes. Because they trade in volume, dealers require large, secure areas for storage and processing. They employ relatively large amounts of working capital and are able to sort materials into the finer grades acceptable to industrial users. To maintain a steady supply, the dealers often establish credit or other obligatory relationships with those hierarchically lower in the system, some of whom work as specialized satellites for the industrial users to whom dealers themselves are tied (Birkbeck 1978, 1979).

DEPENDENCY

While tying is the most common form of dependent relationship within recovery hierarchies, it is only one of many means by which access is controlled and supply is maintained. It is most common where some form of patronage or gatekeeping regulates the recovery system. Patronage occurs most often where a social relationship between opposite sides of the hierarchy exists. This may be a traditional relationship between castes, a relationship between social equals, or a relationship between ethnic, regional, or religious groups that has evolved over time. There is often a degree of mutuality in these patronage relationships, with patrons supplying access to the resource, the market, and, perhaps, secure
housing, cash advances, ceremonial gifts, and relief during
times of desperation, in exchange for loyalty and the right to
extract surplus from their clients (Breman 1985).

Gatekeeping resembles a deformed system of patronage in which access to markets and higher levels of the recovery hierarchy is maintained but none of the guarantees of security and minimum livelihood are offered. Rather, where gatekeeping is widespread, a hierarchy in which only those on directly opposite sides of the production ladder are allowed to make exchanges is strictly, and often violently, enforced (Rebong and Ekna 1979). This structure often develops into highly extractive forms of dependency in which dominant and subordinate social groups are pit against each other.

While both patronage and gatekeeping are practiced by those operating within the recovery system, rent seeking is generally the provenance of those without. For the most part, these are municipal refuse workers, though organized gangs have been known to extract rent from scavengers working within their territories as well (Sicular 1989). The basis of these relations is the power or authority of individuals or groups over those who must seek their permission for access to material sources (Case 1.1).

SEGMENTATION

Many of the hierarchies, which have evolved within waste-recovery systems, have their basis in ethnic, caste, religious, or communal affiliation. In Jakarta, Rebong and Ekna (1979) reported a cleavage between ethnic Javanese scavengers and ethnic Chinese agents and industrial users. In Calcutta, Furedy (1984) reported that scavengers working at the Dhapa dump were predominantly scheduled class migrants from Bihar while buyers were predominantly Bengali. In Cairo, Kodsi, Cook, and Neamatalla (1982) identified an even more complex division in which Coptic Christian Zarrabs collected and processed wastes under contracts negotiated by Muslim Wahis.

While these relationships cannot be defined as noneconomic, they are not based on market principles of supply and
Rebong and Ekna (1979) provide an illustrative example of hierarchy, dependency, and segmentation within the recovery system in place in Jakarta, Indonesia. In 1979, 30,000 scavengers filled the lowest and least profitable level of this system. Directly above them were managers of waste-recovery depots (lapak) scattered throughout the city. Depots served as collection points where salvaged materials were deposited, sorted, cleaned, weighed, and eventually sold. In 1978, there were approximately 300 depots in Jakarta, many managed by former scavengers. While some of these managers were able to save enough money to open a depot for themselves, most were sponsored by agents.

Agents served as middlemen between depot managers and the industries that used recovered materials in their production processes. Agents had specific territories from which they collected materials and specific industrial sites where they distributed them. Many were employed directly by industries to collect recovered materials. Others had looser ties. Many were ethnically Chinese.

Access to any level in the recovery process other than that immediately above was jealously guarded. Limiting access was the principal means of keeping prices for recovered materials low and profits high. Rubber factories, paper mills, and other plants each had their own agents. The tight network was impenetrable to depot managers and completely unapproachable to scavengers. This system, reinforced by patronage and rewards, allowed for contact only between persons or groups on hierarchically opposite sides of recovery access points. Access points were meeting grounds, both literally and figuratively, where hierarchically superior and inferior levels of the recovery industry negotiated the exchange of goods.

Depot managers were forced into unequal exchange with agents by the agents' singular control of access to industrial users. Depot managers who attempted to deal directly with manufacturers who used recovered materials in their production processes, when allowed to trade at all, were forced to sell at a loss or at rates lower than those available through agents. Many were later driven out of business. This was done through selection of new depot managers who were given temporary price advantages. These price advantages allowed for purchase of recovered materials at marginally higher rates than singled out depot managers. Since scavengers were not permanently tied to particular depot managers, they bargained for the highest prices with the least amount of inspection were offered goods. The structure of pricing and degree of monopsony above the depot manager limited what each could afford to offer.

As a self-enforcing system, the recovered-materials market favored agents and final consumers and disciplined both depot managers and, through extension, scavengers, for resistance to the hierarchy of accumulation. Scavengers, at the lowest end of the hierarchy, attempted to compensate for their powerlessness through petty crime and trickery, directed both at buyers and at each other, and, paradoxically, a spirit of collective camaraderie among themselves.
demand. Rather, each was based on traditional loyalties that were both internally and externally supported. Internally, they have relied on some form of common identity. The most remarkable case, the Christian Zarrabs of Cairo, shared both a common religion and a common regional origin, the agricultural area around the Upper Nile city of Asyut.

About sixty years ago, Zarrab migrants to Cairo began filling a productive niche in Egyptian society to which they were suited by profession and religion—the production of pork for the urban market. They raised pigs under their homes around the fringes of the city on organic refuse, which they collected under contract from the Muslim Wahis who controlled access to sources. In time, as the waste stream upon which their production of pork was enriched with other valuable materials, the Zarrabs began recovering inorganic material for sale to local manufacturers. This niche has been solidified through population pressure in the home province, which, among other things, has forced Zarrabs to seek income-earning employment outside their native region. With the access provided by prior migrants, and a secure niche within urban society, this process has allowed for a viable means of relieving pressure on their native agricultural region and of providing a source of income for expansion of landholding, technical inputs, and improved rural living standards.

Hierarchy, dependency, and segmentation within the recovery system have broad theoretical implications relating to the regulation of labor and organization of industry throughout the urban economy and, through its role as a source of employment for migrants, relationships between rural and urban systems. At a more practical level, questions regarding the long-term sustainability and continued evolution of indigenous forms of solid waste recovery have important policy implications relating to urban environmental management.
ENVIRONMENTAL MANAGEMENT AND URBAN SUSTAINABILITY

That urban ecosystems face pressures that overburden their assimilative capacities and push human tolerance to its limits is common knowledge to most residents of large cities. In general terms, these pressures are the product of increasing levels of airborne, waterborne, and solid waste brought about by changing consumption patterns and rising urban population densities. For most of the twentieth century, management of these wastes has been based on traditional patterns of human interaction with nature that rely on the assimilative capacity of ecosystems to capture and recycle wastes.

Air, water, and land were thus looked upon as non-degradable storehouses and neutralizers of wastes. With rising demands placed on ecosystems—locally, regionally, and globally—questions of sustainability have begun to rise to the forefront. Unfortunately, vestigial thinking, which in its economic form views nature as an infinite source of wealth, still holds sway over much of the world and, as a result, the costs (in terms of a re-allocation of energy, material, and information-gathering resources) and benefits (in terms of more supportive interactions with ecosystems) are frequently couched solely in financial terms.

At the center of these debates has been an assessment of what society or, more particularly, fractions of society are willing to pay for improved waste management. One general assumption has been that increasing security in socially determined living standards results in increased willingness to pay for maintenance of lifespace. When taken at the national level, these calculations have equated rising gross national product with increased willingness to pay and have resulted in a gross division of economic growth and ecological sustainability. At a local level, similar patterns of thought have resulted in the provision of urban services such as refuse collection only to those who have the ability to pay.

One consequence of this pattern of the provision of
waste collection service has been an underservicing of much of the urban population. Cuentro and Gadji (1990) estimate that 30 to 50 percent of solid wastes generated within urban areas in "developing" countries go uncollected. The problems associated with lack of collection arise from pathogens in the refuse itself, disease vectors that breed and feed in them, and the presence of hazardous materials. These problems are compounded as accumulated waste clogs drainage systems and causes flooding, spreading potential impacts to wider areas.

Due to both legal and practical constraints, the poor suffer a disproportionate share of risks associated with these wastes. Since many poor settlements are on improperly settled land and do not directly contribute to the municipal property tax base, they may be outside the jurisdiction of municipal refuse companies. Under these conditions, compounded by limited accessibility, the poor rely on individual and collective responses to waste management problems. In the same pattern of interaction with ecosystems that allows municipalities to use controlled dumpsites as a means of treating wastes, the poor and those who collect wastes outside the prescribed system of refuse management turn to vacant lands, most often low-lying wetlands that are, in the process, made suitable for other urban uses, as receptacles for solid wastes.

**LABOR, INDUSTRY, AND THE ECONOMY**

A second factor of the association between poverty and solid wastes can be found in the role waste recovery plays in the income-earning strategies of poor households. Cointreau (1991) estimates that the number of people involved in recycling represents from 1 to 3 percent of the urban population in developing countries. While most specific estimates are partial, relying on enumeration of populations at specific sites or involved in specific occupations, they are enlightening as illustrations of the extent of this phenomenon. Cointreau, for example, records estimates of 10,000 dumpsite scaven-
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gers in Mexico City and 12,000 door-to-door collectors in Cairo; Rebong and Ekna (1979) suggest a population of 30,000 scavengers and junk buyers working in Jakarta, and Furedy (1990) cites a Metro Manila Task Force estimate of 14,000 individuals working at Smoky Mountain, the city's infamous Tondo dumpsite. If it were a production other than the production of commodities from waste, the sheer number of those employed would qualify the recovery industry as a major urban economic base.

This sense of the importance of waste recovery in both the ecologic and economic life of cities is strengthened by an awareness of the volume of materials that it collects, processes, and makes available to industry. In Cairo, 24 percent of the solid waste generated is recycled by door-to-door and dumpsite collectors (Bouverie 1991), whereas in Mexico City, the estimate is closer to 25 percent (Cointreau 1991). The recovery rate in Indonesian cities averages a remarkable 33 percent (Furedy 1989).

The materials thus recovered enter into local, domestic, and international manufacturing processes. Locally, industries using recovered materials range from small-scale producers of low-cost consumer goods (e.g., lamps, buckets, and children's toys) to large-scale manufacturers producing standardized products (e.g., paper, glassware, and molded plastic products). Nationally, recovered materials, which can provide a substantial portion of a country's industrial inputs, are traded for use by large- and small-scale industries. In the late 1970s, Colombia's paper industry relied on scrap paper for 16 percent of its feedstock (Birkbeck 1978). In the Philippines in the early 1980s, this rate was 13 percent, though rates up to 74 percent occurred in particular firms (Bubel 1990). Recovered materials, especially scrap metals and paper, are traded internationally. Although the bulk of this trade is from industrialized to industrializing countries (Office of Technology Assessment 1989), ecologically important and economically significant amounts of recovered materials, such as metals and paper, are traded between industrializing countries, as well.
Finally, besides its role in resource conservation and employment generation, recovery systems can provide an awareness into the multiplicity of productive relations within the urban economy. These relationships, which cross the artificial boundaries separating public and private sectors, urban and rural economies, and individual and corporate interests, suggest that rather than being the central organizing feature of society, markets are embedded in social structures. That these relationships exist even in advanced capitalist societies suggest that they function as buffers from the strict discipline of the market [Polanyi 1944].

POVERTY AND THE STATE

The social and economic structures in which recovery systems operate intersect with state institutions through the state's role in mediating production of the built environment and providing goods and services for collective consumption (Castells 1978). Through its imposed monopoly over the refuse system, which it may choose to exercise itself or contract out to private providers, and through its role in regulating land use, the state has enormous power in setting the boundaries of the recovery industry both by defining methods of refuse collection, transport, and disposal, and in creating or relieving insecurity in the homes and workplaces of those involved in the lower circuit of the recovery system. Among the former, centralization of refuse management in public or privately contracted agencies, done ostensibly to improve the efficiency and effectiveness of management, typically results in restrictions on access to recoverable materials in the waste stream and a criminalization of scavenging. Among the latter, state-supported development policies and programs, while promoting accumulation and increasing living standards on a national or regional level, have also served as vehicles for the further immiseration of large segments of urban poor who have been driven from their homes and from their workplaces. The result of these evictions is a periodic, crippling loss of accumulated assets that, had they
been retained, could reasonably have resulted in incremental improvements in both living standards and productive capacity.

**SUMMARY AND CONCLUSIONS**

Scavenging can be conceptualized as an occupation, a labor process, and an industry in which a functional hierarchy, dependency, and segmentation are common features. Since these features cross economic and social boundaries, scavenging is subject to both prevailing social factors and market pressures. Since it also intersects with municipal refuse collection, transport, and disposal systems, scavenging is directly subject to the state's waste management policies and programs. This imbroglio of market, state, and society produces specifically contextualized forms of organization that require dynamic, contextualized, and holistic modeling. That neoclassical economics should fall short of this task should come as no surprise.

Many of the factors that characterize recovery systems fall outside economic modeling and represent what many economists would call "imperfections." At the same time, all-encompassing political economy models equally fall short because of a failure to take into account local history and context. The suggestion that both boilerplate models of the urban economy fall short of their promise leads one to conclude that while capital may be a dominant force in social life, the forms it takes are locally constrained.
Modeling Society and Economic Life

This chapter will provide a framework for analyzing waste-recovery systems as they exist in industrializing urban Asia. It is written as an exploration of relationships between economic and social forces in organizing production. In this vein, it carries forward several observations regarding recovery systems presented in the previous chapter. Among these observations are the almost paradoxical presence of participation in competitive markets alongside hierarchy and dependence, and divisions of labor based on communal affiliation.

While these observations have been introduced in the specific context of waste-recovery systems, they have broad-ranging significance as factors in analyzing organization of production as a whole. To do so requires a shift from mainstream economic theory, which has been largely incapable of incorporating such social factors into comprehensive models of economic growth and change.

Specifically, by fetishizing the market, neoclassical economic models have underrated ways in which social institutions are called upon to regulate economic activity. Marxist interpretations of similar phenomena have equally fallen short through their narrow focus on structural exploitation and class relations. Both perspectives fail to give credit to those forces of continuity and change internal to social formations. Mechanisms that determine the ways in which industry is organized, labor is recruited, wages are determined, discipline is maintained, and conflicts are resolved are embedded in the historically evolved social, cultural, political, and religious patterns of community relations from which they are drawn.
This chapter will place recovery systems in a broader context of industrial and labor organization that encompasses social and economic dimensions. In so doing, it presumes agreement with the premise that the self-regulating market is neither a natural evolutionary phenomenon nor a monolithic apparatus existing outside society (Polanyi 1944), but rather, a product of social intervention that the state institutionalizes through its regulatory capacities. Furthermore, since the market is unable to capture all production and consumption (i.e., since some forms of production and consumption resist commodification), institutions other than the market must be investigated as factors in a broader theory of the organization of labor and industry.

Primary among these neglected social institutions is reciprocity, a form of exchange based on restitution (Mingione 1991). Reciprocal exchange networks provide a relief from the market's competitive discipline by establishing patterns of corporate solidarity. As the market advances under the state's regulatory guidance, however, these reciprocal networks are often exploited by capital. Nevertheless, because they are at the heart of humanity's physical and psychological need for community, they can never be truly obliterated or subjected to the market's control.

**DUAL ECONOMY MODELS**

Since their initial appearance in the 1950s, dualistic development models have occupied center stage in theories of development. Those emerging within the tradition of neoclassical economics served to popularize a dichotomy between formal and informal sectors. Neo-Marxist models of the same period turned instead to an articulation of modes of production and world systems theory. Both traditions, however, are based on a narrow conceptualization of "development" as either a process paralleling the experience of Western industrialized countries or, conversely, reacting to industrial pressures originating from the West. Neither has given much credence to internal processes of continuity and change.
THE INFORMAL SECTOR

Historical Development of the Two-Sector Model

Much of the literature on scavenging has placed the lower circuit of the recovery industry in the "informal sector," a conceptually difficult term under whose banner many different interests have found refuge. In many ways, it is intellectually related to a long tradition of dual economy models of "development" and the underlying social agendas that have supported them. These models and agendas have been the mainstay of neoclassical conceptualizations of economic growth and social change since at least the early writings of Boeke (1953) and Lewis (1954). At their core, they conceive of development as a process of exchange between a modern urban-industrial sector and a traditional rural-agricultural sector (Boeke 1953; Fei and Ranis 1964; Rostow 1960). W. A. Lewis defined the mechanics of this process in a well-known 1954 essay in which the backwardness and presumed limitations of agriculture were used as a pivot point to advocate for state intervention in accelerating urban-industrial growth and transfer of "unlimited" supplies of rural labor at a constant price to the city.

In the various formulations of the Lewis model that followed, development specialists promoted the exploitation of perceived sectoral, spatial, and social advantages. Sectorally, industry was to be favored over agriculture since it alone provided the technical means of supporting increasing standards of living; spatially, cities would be favored over rural areas since they could furnish the agglomeration and scale economies needed for efficient production; and socially, private accumulation would be favored over equity since short-term imbalances were necessary to build a capital base upon which investments could be made. Over time, however, these models predicted that, as the markets for capital, land, and labor sought equilibrium, sectoral, spatial, and social disparities would diminish.

As it became evident that these disparities were not
diminishing and that expanding public and private wage labor was lagging behind the supply of would-be entrants, researchers began to ask why, despite bleak possibilities of finding stable urban employment, rural people continued to leave kith and kin for an uncertain life in the cities. The answer appeared to be a matter of factor price distortions. By subsidizing and protecting large farmers and industrialists, government policies, intended to induce development, bifurcated the economy into low (rural) and high (urban) wage sectors, subjecting the former to “involution” while the latter, encouraged by modern management techniques and technology import privileges, expanded without the anticipated capacity to absorb migrant labor [Higgins 1956].

As a result, potential migrants from rural areas, facing the certainties of low wages in an involuting rural economy, had to carefully weigh their chances of finding employment in the relatively high-wage urban economy against the likelihood of extended periods of unemployment or underemployment. Crucial to this choice was a calculation of expected income, a ratio of expected wages to waiting time as measured by levels of open unemployment [Todaro and Harris 1971]. As real or perceived urban-rural wage differentials increased, so did the lure of expected urban income, the length of time a migrant was willing to wait in reserve, and the rate of urbanization and slum formation.

Keith Hart (1973) took Todaro and Harris’ factor price distortion model, and by observing the day-to-day life of the urban poor, spun the model on its head. He suggested that the “reserve army of the unemployed” did not constitute an unemployed labor force passively waiting in the wings for the chance of high-income employment while parasitically living off the urban largesse. Necessity obligated urban migrants to find a means of sustenance. Rather than being a drain on urban society, he proposed that these means comprised an alternative economy with an autonomous capacity for generating income, apart from any hope of future employment in the high-income wage sector [Hart 1973]. Hart
called these ingenious expedients, ranging from petty capitalism to theft, the "informal sector."

Since its introduction into development literature, a wide variety of interests have found the informal sector useful as a means of supporting social, political, and economic agendas. The first to do so was the International Labor Organization (ILO) which, by positing Hart's autonomous informal sector against an equally autonomous formal sector, attempted to describe "a duality that avoids bias against the low-income sector" (ILO 1972) (see Table 2.1).

The reasons for this reformulation of the traditional-modern dichotomy are revealed in the context of that choice. During the late 1960s and early 1970s, it had become increasingly obvious to many observers that African economies had become burdened by monopolistic and exclusionary arrangements between the state and private industry. These arrangements drained resources from more productive activities and established a privileged class of insiders. If the ultimate goal of self-sustained growth were to be achieved, imperfections would have to be reduced and development assistance would have to be transferred to more "efficient" users of resources. Thus, the ILO openly supported, in contrast to the highly capitalized, protected, and privileged modern sector, dynamic and progressive elements indigenous to African economies. The ILO chose to identify these dynamic, indigenous elements with Hart's informal sector. In this way, two paradoxical streams were combined: one associating the infor-

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<th>Table 2.1 Hypothesized attributes of the informal and formal sectors</th>
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<td><strong>Informal sector</strong></td>
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<tr>
<td>Ease of entry</td>
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<tr>
<td>Indigenous resources</td>
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<tr>
<td>Family ownership</td>
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<td>Small-scale operation</td>
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<td>Labor-intensive and adaptive technology</td>
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<td>Skills acquired outside the formal system</td>
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<td>Unregulated and competitive markets</td>
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Source: ILO [1972].
mal sector with poverty and the hard fight for existence at the bottom of the urban ladder, and the other identifying these efforts with an inherent dynamism capable of self-sustained economic growth.

**Criticism and Continuity**

Criticisms of the informal sector hypothesis, which appeared almost immediately, have become legion (Bromley and Gerry 1979; Moser 1984; Breman 1985; Peattie 1987). In the broadest terms, these criticisms can be viewed in three contexts. First, the positing of formal and informal characteristics against each other created an artificial dichotomy which focused investigation on differences between the two hypothesized sectors and detracted attention from investigation of underlying commonalities. Second, reliance on the enterprise as the primary unit of analysis homogenized divisions within firms and ignored relations between them. Third, though collusion between the state and capital was suggested as a source of imperfection, neither of them was integrally incorporated into the model.

Each of these broad areas of criticism was supported by detailed investigation into the workings of small-scale enterprises, and between these enterprises and larger firms, which proved false the major assumptions of the model. For example, the model generally proposes that the informal sector is open to all migrants, whereas the formal sector is protected and absorbs labor at much lower rates (Sussangkarn, Ashakul, and Myers 1986). The key factor in this proposition is an assumption that regulation in the formal sector hinders employment growth whereas lack of regulation in the informal sector allows it to be infinitely elastic. The presumption that follows from the protected versus unprotected dichotomy is that workers in small enterprises operate in a more competitive sector of the economy, with incomes that are lower than those of unskilled workers in larger enterprises. This proposition has often been supported through studies, based on national accounts statistics, which equate the informal sector with self-employment and unpaid family work.
In time, each one of these assumptions and propositions has been demolished. The most basic assumption, the assumption of infinite elasticity due to lack of regulation, has fallen to studies that have shown entrance into both small- and large-scale enterprises is often marked by pronounced ethnic, regional, and territorial restrictions, and that, rather than being unregulated, small- and large-scale enterprises are regulated by internal and external factors (Bromley and Gerry 1979; Harriss 1989; Breman 1985). The wage differential proposition has been shattered by studies indicating that large-scale, foreign-investment-dominated sectors often hire employees at wages much less than those received by equivalent-level, small-scale entrepreneurs. In fact, some studies have indicated that laborers in these firms view their employment as short-term. Rather than continued wage labor, such “formal sector” employees anticipate saving enough to start their own small business. Finally, studies of the self-employed have indicated a confusion of boundaries. While it may generally be assumed that large firms are more likely to hire wage labor than small firms, many day laborers (e.g., construction workers and home pieceworkers typically classified as self-employed in national accounts statistics) clearly and often directly are employed by large firms. This will likely become more so as flexible production methods—which typically subcontract specialty, overflow, or short-cycle work to small firms—expand. Although much of this work is unregulated, unreported, and pays low wages, it is difficult to consider it “informal.”

Summary
In the end, the informal sector hypothesis has become a convenient catch-all, which, while having little empirical content, has served as a springboard for many private agendas. The two most common of these agendas were based on Hart’s conceptualization of the ingenious expedients of the urban poor and the ILO’s use of that conceptualization as a tool for criticizing state-subsidized industries. This dual track has become a standard feature of the informal sector debate that
has contributed to its broad appeal to both economic liberals, whose interest is in creating self-regulating markets, and social liberals, whose humanitarian concerns direct their attention to the conditions of poverty. In other words, by turning the harassed and harangued work of small manufacturers and traders into a virtue, the informal sector hypothesis has provided a politically expedient means of advocating for the poor while also serving the interests of conservative, market-oriented forces. This coalition of humanitarian ends and market means has provided an alternative to more radical social programs since anonymous imperfections in the market could be identified as sources of inequity, whereas policies intended to "get prices right" could provide a framework for advocacy of small producers and traders (DeSoto 1989).

MODES OF PRODUCTION

Although scavenging has most frequently been analyzed as an informal sector activity, the wealth of data linking the trade to larger productive hierarchies has forced many authors to seek alternative analytical bases. The most prominent of these has been analyses based on the articulation of modes of production (Birkbeck 1979; Sicular 1989). The principal contribution of this approach has been its focus on social relations within production hierarchies. While risking devolution to a vulgar structuralism, this neo-Marxist approach has provided important insights into the organization of waste-recovery hierarchies and the nature of change within them.

Articulation of Modes of Production

At about the same time that neoclassical economics captured formal-informal sector dualism for its analysis of sectoral and spatial divisions of labor, neo-Marxist thinking turned toward a different type of dualism, namely, the articulation of capitalist and precapitalist modes of production. The seminal statement most often referred to is Laclau's assertion
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that capitalism had not fully penetrated the "Third World" but was instead overlaid upon pre-existing modes of production. Following the work of the Althusserian school of structural Marxism, and as argued by some Dependency theorists, subsequent advocates of the "articulation of modes of production" approach argued that the capitalist mode of production penetrates, dominates, and preserves precapitalist modes of production by restructuring them for capitalist accumulation (Laclau 1971; Ruccio and Simon 1986). In this process, not only can capitalist penetration undermine, dissolve, and transform precapitalist modes of production but it can also create opportunities for the emergence of noncapitalist modes of production where they did not exist (e.g., feudalism in Latin America) and strengthen the position of precapitalist classes rather than eliminate them (de Janvry 1985).

During these processes of conservation and dissolution, which were expected to eventually lead to complete transition to capitalism, transitional modes of production were anticipated to develop. One such mode of production, "petty commodity production" or "petty capitalism," was characterized by its subordinate integration into capitalism and an incomplete division of capital and labor (Scott 1979). Since these mostly small-scale, owner-operated enterprises could also be considered "informal," it did not take long for the traditional neoclassical and emerging neo-Marxist paths to intersect.

Casual Work and Vulnerability
Bromley and Gerry (1979) attempted to synthesize neoclassical and neo-Marxist dualism through the creation of an analytical framework based on the vulnerability of workers. Employment options were divided into two clusters, each identified by common characteristics. Vulnerable workers were characterized as employed on a day-to-day basis, indirectly employed by larger firms through home piecework contracts or bound by credit arrangements, apprenticeships, or dependent patron-client relationships (Bromley and Gerry
Secure labor, in contrast, was characterized as receiving stable wages, protection through provisions in labor laws, and, possibly, pension benefits, health care, and union representation. Only those outside these categories were considered "self-employed" (Bromley 1978), a condition that did not foster security but rather created different avenues of vulnerability.

In deviating from the simple two-sector model proposed by conventional development theory, Bromley and Gerry were able to grasp a more integrated view of labor and employment. More specifically, by contextualizing labor relations within associated networks, they linked larger scale enterprises to street trades (Bromley 1978) and other small, service, trading, or producing enterprises (Bromley and Gerry 1979). Furthermore, by separating self-employment from other forms of disguised wage labor, they uncovered a small, but vulnerable, space for autonomy within the capitalist economy. Finally, by noting licensing requirements, police-protection rackets, and various forms of accommodation, they affirmed the role of the state in regulating seemingly unregulated businesses.14

Self-Employed Proletarians
Bromley and Gerry's melding of the articulated modes of production framework with "informal sector" research also provided the basis for the principal political economy of scavenging—that of Chris Birkbeck's study (1978, 1979) of the "vultures of Cali." Birkbeck perceived the system of waste recovery in Colombia as a hierarchy of articulated modes of production within which each successive layer extracted surplus value from a lower level. His particular point of entry into this system was through his analysis of the paper industry centered in Cali, Colombia.

The central paper firm, Carton de Colombia, Colombia's largest paper producer and a former subsidiary of Mobil Oil, was at the head of the system. On the first rung below the central firm were nineteen central warehouses. These were spread throughout the country and were directly contracted
by the firm. Carton de Colombia supplied packing machines, set prices for various grades of recycled wastepaper, and provided loans to cover operating costs. Although officially classified as independent contractors, many of the warehouse managers had clear ties to Carton de Colombia through previous employment with the firm.

Each of these central warehouses was supplied by smaller satellite warehouses. Satellite warehouses collected recycled materials from petty traders, junk buyers, and scavengers. Most were directly owned by central warehouses, which, in turn, fixed prices paid to the waste-paper collectors and provided daily working capital to the satellite firms. Many independent satellite warehouses operated under informal arrangements with central warehouses. These suppliers had no formal contracts with the central warehouses and received no operating capital. There were eighteen satellite warehouses in Cali, spread out in the poorer neighborhoods of the city.

Profit was maintained at each of the warehouse levels through the process of transformation (sorting, packing, and transport) and was dependent both on volume and the maintenance of agreements with the central firm or its agents. Labor was unorganized and intentionally maintained in this condition by direct intervention of Carton de Colombia.15

The roughly 1,000 to 1,200 scavengers and junk buyers working in Cali, at the lowest and most distanced labor level, received average daily incomes approximately one-third of those received by the regular industrial workforce. Their incomes reflected three important conditions surrounding their position within the system: low value added to output per worker, a low volume of output per worker, and competition for resources among workers. In addition, the availability of alternative material supplies (raw pulp)16 and the need to reprocess wastepaper limited the competitiveness of the waste recycler's resource—unprocessed wastepaper. Since scavengers and junk buyers could only be paid with "one eye on the price of raw materials," within the confines of the current arrangements, in which they operated as "self-employed proletarians,"
waste recovery could only be a low-income occupation. In the end, Birkbeck concluded that the scavengers working at Cali’s dump were not poor because they were not working. They were poor precisely because they were working.

Birkbeck’s analysis of scavenging dispelled many of the myths of informality and self-employment, most significantly in his linkage of poverty to disguised employment in larger firms. Nevertheless, several points in his analysis could be served through a critical reinterpretation. In particular, his overzealous focus on the paper industry obscured the fact that scavengers were not entirely tied to the collection of paper and carton for their livelihoods, but that they collected a number of materials. As a diversification strategy, this allowed scavengers to actively seek higher priced materials while rejecting those of lower value. That each of the channels through which these materials were reintegrated into production processes extended out from initial sales to depot operators is a significant feature of the recovery system largely undertheorized by Birkbeck. Scavengers at Cali’s dump were tied to vertical systems of production through these relationships. Nevertheless, rather than viewing dumpsite buyers as their exploiters, scavengers looked to them as “natural leaders” (Birkbeck 1978). During crisis, depot operators, rather than fellow scavengers, were relied on to act as intermediaries and organizers in protecting group interests.

Pockets of Peasants
Sicular’s analysis (1989) of scavenging in West Java carries forward several of the themes introduced by Birkbeck, though his conclusions are quite different. Although Birkbeck envisioned scavenging as within the system of capitalist production, Sicular viewed it as an essentially noncapitalist activity articulated with the capitalist economy through the market. He assails Birkbeck’s conception of scavengers as “self-employed proletarian” as a contradiction in terms, arguing that “self-employed,” which assumes ownership of the means of production, and “proletarian,” which assumes a condition whereby the worker’s only asset is labor power, are incom-
patible terms. He considers this unfortunate combination of terms to be from Birkbeck's reliance on an urban-industrial-capitalist analytical framework, a reliance that led to inattention to noncapitalist relations of exchange. Sicular suggests that if Birkbeck had paid greater attention to noncapitalist relations of production, then evidence contained within his case study that suggests the presence of social factors in relations of exchange would have received greater prominence.

Using these relationships as his starting point, Sicular attempted to develop a paradigm of intersecting capitalist and noncapitalist sectors based on unequal exchange through the market. His empirical evidence was garnered from seventy-three in-depth interviews conducted by researchers at the Environmental Research Center at Bandung (Indonesia) Institute of Technology carried out in conjunction with an action-oriented research project at Jati Dua, also in Bandung. This research pointed to two central features of scavenging in West Java: the role of the household as the basic unit of production and the role of small traders as intermediaries between scavengers and upper circuits of the recovery system.

Sicular illustrated these themes in his description of the Jati Dua community. This community consisted of two groups of households each tied to a particular small trader, referred to by Sicular, after the Indonesian term, as "receivers." Receivers provided housing and storage space, protection from local authorities, gifts of food during religious celebrations, and cash advances when needed. For these services, they obtained proprietary rights to the materials collected by community members. Although this obligated receivers to purchase materials for which market demand was low, it also provided justification for a systematic lowering of prices. This "unequal exchange" was tolerated by scavengers who depended on receivers within the closed economic system.

Among scavengers living in Jati Dua, the household served as the basic unit of production, with each household retaining ownership of the means of production. Within house-
holds, however, there was a distinct division of labor consistent with mainstream social customs. Women worked within the community's territory—sorting, washing, grading, and packing—while men roamed city streets gathering materials.

Sicular suggested that these relationships within and between households justified the classification of scavenging in West Java as a "peasant form of production" and scavengers as "pockets of peasants in Indonesian cities" (Sicular 1989, 41). He bases this claim on a reading of Harriet Friedmann's 1980 analysis of agrarian systems in which she offers the concept of "form of production," identified by a double specification of a "unit of production" and the "social formation" in which it operates, as an attempt to reconcile Chayanov's concern for household production with Marxist concepts of surplus appropriation and class formation. Ideally, in agrarian production, this effort was to lead to a means of differentiating various social formations typically bundled under the term "peasant." Peasant production, in her classification strategy, could be typified as a form of production in which the household was the basic unit of production and the social relations of production were governed by "particularistic communal or class relations" (Friedmann 1980, 162). Among the latter are horizontal and vertical reciprocal relationships, and various institutions of dependency including usury, precapitalist rent, appropriation of labor, and unequal exchange (Friedmann 1980, 173). Since these means of surplus appropriation were considered outside the market, Friedmann (and Sicular) consider peasant production as essentially "noncapitalist."

Sicular asserts that Friedmann's definition of the peasant form of production equally applies to scavengers in West Java since they also "engage in household production in the context of non-capitalist productive relations" (Sicular 1989, 38). That scavengers are urban, rather than rural, and are not involved in agrarian production but rather the production of commodities from waste does not seem to disturb him. In fact, he asserts that "if 'peasant' is to be considered a valid term in political economy, there is no apparent reason why
it, like 'simple commodity production' and 'capitalism' cannot apply in both rural and urban areas" (Sicular 1989, 38).

Despite his obvious talents as a researcher, Sicular's identification of scavenging as a peasant form of production contains elements of slight of hand, which is evident in both his theoretical treatment and in his case study. On theoretical grounds, Sicular errs in extending Friedmann's definition of the peasant form of production to a nonagrarian context, the logic of which forces him to separate peasant production from a land base. Sicular develops this argument by first noting that one element of peasant production, which evolves within the noncommoditized milieu of noncapitalist production, is that peasants "have difficulty responding to market forces" (Sicular 1989, 36). The roots of this difficulty are in the dual nature of the peasant household as producer and consumer (Heynig 1982, 16). In this duality, peasants respond to market pressure by either expanding production to maintain a minimum subsistence level, or, in the other extreme, withdrawing from commodity production altogether through concentration on production for direct consumption. This ability to retreat into production for household consumption, made possible by access to land, is a fundamental characteristic of peasant production without which it is difficult to conceive of a peasantry. Sicular's theoretical trick is to equate ownership of the means of production in an agrarian context, which assumes a land base, with ownership of the means of production in an urban context, which does not (Sicular 1989, 38). Although this does not rule out retreat into subsistence based on scavenging for consumption, with no source of nonmarket subsistence, most scavengers can only maintain a minimum livelihood in declining markets by increasing production.

The uncovering of this theoretical trick does not, however, rule out the possibility that some scavengers in Bandung are, in fact, peasants and can retreat into land-based subsistence. Sicular notes both circular migration between Bandung and rural villages and other forms of rural-urban social links, including gift giving during religious festivals and sequester-
ing of children with relatives in the countryside. These links presume some access to agrarian systems that, if investigated, may have provided more substantial evidence of the peasant-scavenging link than Sicular's predominantly theoretical approach. Had he more carefully examined patterns of circular migration, linkages with rural agricultural systems, local self-provisioning, spatial divisions of labor, and forms of labor market partitioning, Sicular's "pockets of peasants" argument would have been much more convincing.

Finally, although Sicular has suggested the role played by state agencies in delegitimizing scavenging, because his presentation is divided into separate sections on waste recovery and refuse disposal, these connections are not sufficiently clear. Thus, although he argues that the formal exclusion of scavenging as an option in solid waste management resulted from the state's interests in centralized refuse disposal and recovery systems—based largely on bureaucratic hegemony and the internationalization of waste management—he gives little attention to the day-to-day operation of solid waste management, which, by his own account, is heavily influenced by the work of scavengers.

Summary
The modes of production framework, despite its drawbacks, has made major contributions to the study of industrial organization and labor systems. First, unlike the formal-informal sector model, it explicitly links seemingly independent traders, manufacturers, and service providers to a larger production system. This takes the analysis much further than one that simply labels one sector of the economy as informal, static, or independently floating outside the urban-industrial motor of economic growth. Second, it correctly views labor market formation as an historical process intimately related to the expansion of capitalist relations of production. Finally, by turning attention to the social relations of production, it provides an important base from which to examine social responses to market forces.

Nevertheless, the articulation of modes of production
model has several internal flaws, all of which became evident as research moved from heuristic modeling to practical investigation. First, the model has a globalizing tendency that ignores local histories of economic growth and change in favor of classification of firms into categories based on their preconceived relation to capital. Like the "informal sector," this theoretical lens can obscure more than it reveals, particularly when the model is joined, as it often has been, with a vulgar structuralism attempting to find exploitation everywhere. This latter point leads to the second complaint. The model has a problem "articulating" modes of production and relationships between them. Here, the theoretical discussion of "petty commodity production" is particularly instructive. Having identified petty commodity production as both an owner-operated and dependent form of production, field research has been unable to identify the simultaneous juncture of these conditions in a wide assortment of situations. While the former condition introduces an extraordinarily heterogeneous variety of work situations, the latter limits the specificity of the term only to those situations in dependent positions. These leave a wide area of noncongruence for which the model has little to say except, perhaps, that as providers of low-cost goods to labor, these firms are indirectly dependent. In other words, the model leaves no space for autonomy. This leads to the third, and perhaps most important point. Modes of production analysis is as captive to the market paradigm it opposes as neoclassical dual-sector models. That is, in both the neo-Marxist and neoclassical conceptions of duality, there is a tacit assumption of the domination of economic factors in production, consumption, and social reproduction. On these grounds, while neoclassical dualism has focused on imperfections in the economy as the source of social inequities and neo-Marxist dualism has concentrated on class struggle in the productive and consumptive spheres, both have tended to ignore nonmarket relations that underlie and support them.

The result of these blind spots is that although Bromley, Gerry, Birkbeck, and Sicular have made significant attempts
to leap beyond the constraints of the model under which they were operating, its impact on their research is still felt, particularly as it blocked the avenues of investigation that might have incorporated local ethnic, caste, race, gender, or religious factors into their analyses.

**ANTHROPOLOGICAL AND SOCIOLOGICAL PERSPECTIVES**

Economic anthropology and sociology provide a different view into the business of small-scale, labor-intensive, network-linked labor situations. This perspective gives dominance to the social relations that underlie economic arrangements. The function of many of these arrangements is to provide guarantees under uncertain conditions and allow for protection of economic interests against outsiders. While not ignoring the role of capital, these models have done much to re-integrate society and economy, thus providing a clue to the nonmarket forces at work in labor market formation and industrial organization.

**LABOR MARKET SEGMENTATION**

Jan Breman was one of the first to challenge the informal sector hypothesis through an analysis of the social relations within it. Based on observations in South Gujarat, India, Breman (1977) suggested that the “informal sector” could not be demarcated as a separate economic compartment or labor situation. Rather, he found evidence to suggest that various forms and relations of production were integrated into an overall production system. Unlike the modes of production model, however, Breman proposed that the parts were segmented not by scale, relations with the state, or mode of production but by the trustworthy loyalties of family, caste, religion, ethnicity, and place of birth. These patterns of organization were called upon because of near saturation of the urban labor market and, hence, extreme competition between would-be entrants. Breman suggested that under these conditions of scarcity, certain occupational roles or activities were fenced off by and for social equals, while dependent patron-
client relationships were entered into with social superiors. These arrangements, which were intended to reduce the risk of obtaining and maintaining access to work and provide a secure, if low, income, transcended the boundaries of “formality” and “informality.” In so doing, Breman brought attention to the internal functioning of urban labor markets and showed that what might be termed “market imperfections” were, in fact, the standards of labor organization, not isolated to the “informal sector,” but spread throughout the labor system. Later research (Harriss 1989) has confirmed this point, indicating that labor within large-scale, supposedly formal, firms was often organized through nonmarket means.

Unfortunately, because of its limited focus, Breman’s study is incomplete. It has no macroperspective and is primarily concerned with the functioning of labor markets under conditions of scarcity. Nevertheless, by describing how social groups actively capture segments of the labor process and regulate access to markets, Breman provides a vital first step in bringing society back into the discussion of industrial organization and labor systems, a subject that has increasingly engaged researchers over the past few years (Granovetter 1990).

A CRITICAL SOCIOLOGY OF ECONOMIC LIFE

Through his reinterpretation of selected writings of Polanyi, Marx, Weber, and Durkheim, and his own research in Italy and Eastern Europe, Mingione (1991) takes another step in this direction. Like others before him, he has entered into the consideration of industrial organization and labor systems through research on informal economic activity. To his credit, however, he has moved beyond an analysis of the patterning of discrete phenomena to questions of “both changing social reality and of inadequate instruments of interpretation” (Mingione 1991, 1).

In brief, by stressing the crucial role played by society and the state in organizing and regulating markets, Mingione directly challenges the paradigm “of the self-regulating at-
omized market as the main pattern of social organization in the industrial age” (Mingione 1991, 3). He considers the market to be embedded in society through an interplay of communal and associative relations and behaviors. Communal relations and behaviors rest on various types of emotional, traditional, or affectual bases and are often expressed through reciprocity. Associative relations and behaviors rest on a rationally motivated adjustment of interests and are often expressed through mutual consent to a process of redistribution. During industrialization, the state is called upon to play an increasing role in accommodating tensions that develop between the market and society. It does so primarily through regulatory measures of the associative kind. The state’s increasing role as regulator of conflicts between the market and society does not, however, either eradicate or sublimate under its control reciprocal relations and behavior. Rather, reciprocity is both embedded in associative regulatory systems (hence nepotism) and exists on the margins of these systems (hence the second economies of formerly socialist Eastern Europe).

He bases his argument first on the writings of Polanyi (1944, 1977). Following Polanyi, Mingione considers market-competitive behavior one of the three basic forms of the social relations of exchange, the other two being reciprocity and redistribution. Although similar in function, neither Mingione nor Polanyi consider these three forms of the social relations of exchange equal or occupy similar organizational roles in society. Specifically, while market-competitive behavior is assumed to operate outside socio-organizational constraints, systems of reciprocity and redistribution determine not only “patterns of social relations of exchange but also patterns of social organization” (Mingione 1991, 3). This is due to the nature and requirements of each of these forms of the social relations of exchange. Reciprocity, based on delayed or eventual restitution, and redistribution, based on the collection and allocation of goods by virtue of custom, law, or central authority, depend on established socio-organizational networks to set rules that determine what
resources are taken, by whom, to whom they are allocated, in what proportion, and for what reasons. Competitive market behavior, defined as an abstract pattern of anonymous exchange between atomized actors in a self-organized system of unrepeatable social relations, only makes sense if it is perceived to be unaffected by other kinds of established social relations. Since this form of exchange cannot exist in social reality, Mingione does not consider market-competitive behavior to have the capacity for social organization. Rather, he considers market-competitive behavior to occur within historically established conditions of social organization shaped by complex mixes of reciprocity and redistribution. These mixes undergo change in order to accommodate the increasingly faulty working of diffused market interaction, but they have not been replaced by a socio-organizational system brought about by market interaction itself. (Mingione 1991, 4)

Mingione contends that most models of industrial society have been captured by economistic thinking that has clouded their perception of both society in general and reciprocal exchange in particular. He notes that Marx considered industrial society to be founded on the interplay of market-competitive forces and social factors, especially those relating to class and state, which determine redistribution processes. Typically termed the “social relations of production,” these mostly associative factors, predominantly based on defense of common interests, were assumed by Marx to structure industrial society. Reciprocity, a communal factor, was, however, generally undervalued as an organizational factor in industrial societies and more likely considered as a remnant of precapitalist society. Mingione considers the basis for this oversight to be due to the greater explanatory value given to the laws of capitalist accumulation over socio-organizational processes and relations. As a result, while Marx’s focus on associative relations within processes of redistribution is to be commended, Marxist class analysis is of limited use as an interpretive instrument in cases where reciprocal relations are strong or growing.
Weber (1947), according to Mingione, faces a similar problem with the market paradigm. This is related to his program for interpreting industrial societies, a program torn between the need to give priority and autonomous sociological significance to increasingly important goal-oriented economic action undertaken by homo economicus (rationality) and a recurrent intuition that this kind of action is always subject to various kinds of social conditioning (irrationality). This is particularly evident in his typology of pure types of socio-organizational factors. While his division of socio-organizational factors into communal (traditional or affectual) factors and associative (defensive solidarity) factors roughly resembles Polanyi’s divisions of social relations of exchange into reciprocal and redistributional factors, because he considers communal bonds “irrational” and associative bonds “rational,” Weber places market-competitive behavior firmly in the associative cum rational side of the social balance. As a result, Weber considers communal means of regulating the market, versus associative, as an exception rather than a rule.

While strongly disagreeing with this latter point, Mingione seeks to reconcile his own sense of the interplay between associative and communal factors in regulating the market with Weber’s rationality-bound perspective. He does so by examining Durkheim’s conceptualization (1984) of social solidarity.

Durkheim gives priority and autonomy to social variables in regulating industrial society. Key to this assessment is his concept of social solidarity, classified as mechanical solidarity (solidarity through similarity) and organic solidarity (solidarity through complementarity). Durkheim assumes mechanical solidarity, a concept similar to the idea of social organization through predominant links of reciprocity, organizes “rarefied” preindustrial societies, whereas organic solidarity, based on complementarity, organizes “dense” industrial societies. The state and the political system play an increasingly important role in reducing anomie, lack of social regulation, in industrial transformation and division of labor through the evolution of collective processes of social con-
trol. These regulatory structures, such as the institution of contractual law, are insufficient, however, without a consequent deepening of organic solidarity and development of complementary links between groups in civil society. Within this vision of society, behavior is atomized but controlled by the structure of associative organization [i.e., a form of social organization in which individuals of the same socio-occupational interests associate with one another not only to defend common interests but also to regulate cooperation with other complementary corporate groups]. Like Weber, Durkheim's evolutionary foundations lead him to conclude that mechanical solidarity, a system of reciprocity, would fade with the expansion of industrial society.

Bringing these concepts together, Mingione relies on Polanyi's analysis of embeddedness in fixing his conceptualization of the place of the market in society; Marx provides initial insight into the importance of social relations of exchange in determining social structure; Weber isolates these social relations into two broad groups—one based on associative factors and the other on communal factors; and Durkheim provides a role for the state in establishing regulatory structures. Taken together, this leads Mingione to conclude that the combination of communal and associative factors, the "socialization mix," serves as the primary regulatory system within given social formations. Crucial to this mix are the processes of redistribution that exist, both within and between communal and associative systems. In this process, the state takes a role primarily in regulating associative relations. Reciprocal relations, however, are more particularistic and less open to control by central authority. As these two systems develop in parallel, wide areas of noncohesion are often created and, while associative factors have greater strength due to state support, they are not capable of either eliminating or totally controlling systems based on communal factors.

The clearest example in this respect is that of socialist industrial societies. In them, the associative system, under authority of the state, has taken on a dominant role in redistribution. This has not, however, prevented families, kin-
ship groups, ethnic communities, and other solidarity networks from acting in a way that does not cohere with the way the institutional system functions (Mingione 1991, 7).

This awareness of the persistence of communal factors in regulating economic life has served as Mingione's springboard into an important synthesis of various strands of sociological thought on the workings of the market. He rightly highlights the embeddedness of the market in society, the role of the state in regulating economic activity and the interplay of market, redistributive, and reciprocal factors in shaping the contours and adherence to these regulatory measures.

Nevertheless, like the classical sociologists on which he relies, his model of socioeconomic relations falsely suggests that the state is a nearly autonomous entity. Thus, while drawing on Durkheim to confirm the importance of social solidarity as a source of underlying support for the state's regulatory efforts, he has little to say regarding the social and political processes through which these regulations are formulated. While it may be his intention to suggest that state policies and regulatory measures well up from civil society or are dominated by class interests, this is not clear in his narrative. Second, while undermining the concept of the informal sector, Mingione retains it as his entrance into the investigation of social relations of production. This retention of terms undermined by the logic of his argument serves to narrow investigation of the factors he puts forward as essential to the understanding of the organization and regulation of labor to the relatively limited area of socioeconomic life frequently identified as "informal."

**SUMMARY AND CONCLUSIONS**

The frameworks outlined in previous sections of this chapter have each made their contributions. The informal sector hypothesis turned attention away from a one-sided view of development as consisting of large-scale industrial and public infrastructure projects and opened a pathway for investigation into the small-scale labor situations in which the
majority of people in the developing capitalist world lived and worked. The articulation of modes of production provided a venue for examining interfirm linkages, the role of capitalist penetration and domination in structuring economic activity, and issues of dependency at the international, interfirm, and interpersonal level. Breman's economic anthropology perspective opened a discussion of noncapitalist forms of reciprocity in the relations of exchange. Finally, Mingione, by asserting that market-competitive behavior is regulated both by systems of reciprocity and redistribution, broadened this perspective to a theory of socioeconomic life.

DEFINING THE TASK

The task remains to incorporate this growing base of theoretical insight into a coherent model of industrial organization and labor systems that, in addition, adheres to its own principles of historicity. In the broadest sense, this model would have to identify units of analysis and explain changing relationships between them over time. More specifically, it would have to provide explanations for a variety of industrial and labor systems and the role of the market, state, and society in regulating them. It would have to explain these processes within both local and global settings, take into account the undertheorized role of communal relations, and predict transformations within historical contexts over time.

This is a large order that has defied the attempts of many, although the issues involved have each been discussed and described many times. The problem is that an integrated model would have to systematically link a variety of factors at different scales through multiple disciplinary filters. Should the perspective be economic, sociological, or political? Should the primary unit of analysis be the household, the firm, or the system? Like the six blind men of Hindustan who came to see the elephant, the point of contact sets in motion a train of limited associations that does not offer an integrated picture.

Nevertheless, this discussion would not be complete
without its own attempt at modeling. So, on a cautious note, recognizing that totalizing theories have value only as modes of investigation, I will begin with a summary of factors to be considered and end with a framework for interpreting relationships between them.

**The Social Relations of Production**

Borrowing from Polanyi (1944), Weber (1947), and Mingione (1991), market-competitive behavior, reciprocity, and redistribution will be considered the three basic forms of exchange. Although one or the other of these forms of exchange may be dominant in a society, this dominance has never precluded the presence and operation of each of the other forms of exchange. Thus, reciprocity among members of a social network and redistribution by the state through centralized collection and reallocation are features of “market economies” while similar reciprocal exchange networks and private markets exist in “planned economies.”

The socio-organizational system in which these relations of exchange exist is built on a dynamic and variable mix of communal and associative factors (Figure 2.1). Communal factors, based on traditional or sentimental attachments to people and place, are most often identified with reciprocal processes. Associative factors, based on intergroup competition or cooperation, are most often linked with redistributive processes. Although these two sets of factors are assumed to be organizationally separate, they overlap, at times, in marked areas of noncohesion. In simple terms, within peasant communities, landlords may hold both

---

**Figure 2.1**

Relationship between associative and communal systems

- **Associative factors**
  - Predominantly redistributional
- **Communal factors**
  - Predominantly reciprocal
- **Area of noncohesion**
a class-based interest (associative factors) and an interest in maintaining a particular standing within the community based on reciprocal relations (communal factors). These two interests are not congruent, though they do overlap.

**The Market**
The market will be considered an institution within society regulated by its own internal dynamics and by interventions imposed by society and the state. Such regulation is necessary because there is marked tension between the logic of capital accumulation and society's need for security and continuity. Friedmann (1988) calls this the conflicting demands of economic space and lifespace. This conflict, which has local, national, and international dimensions, is based on the market's fictive commodification of land (nature) and labor (society), and society's efforts to both resist and accommodate (Polanyi 1944). Under the strained conditions of accelerated economic growth or decline, the market often exceeds its social bounds, a situation that produces high levels of social dislocation. As society adjusts to these upheavals, it influences how the market operates and, more particularly, how labor and industry are organized and regulated. In particular, under conditions in which markets exceed their social bounds through either rapid growth or decline, traditional bases of social organization may be called upon for guarantees of minimum subsistence.

**The State**
The state will be considered a legal, institutional, and bureaucratic apparatus holding a sole monopoly on the legitimate use of force within a territory (Weber 1947). As an institution within society, the state draws on society for its norms and imposes these norms on society as a whole. Its source of legitimacy relies on maintenance of a critical level of social solidarity, often based on adherence to an ideological construct such as monarchy, development, or revolution. Ideology, however, cannot suffice on its own. For its ideological base to retain legitimacy, the state must provide for
the minimum collective material and social needs of its citizens and allow for the self-provision of those it does not provide.

One of the state's primary functions is the regulation of activities within its borders. A characteristic feature of industrial societies is regulation of economic and social life through legal and administrative rules of the associative kind. With these rules come an increasing bureaucratization. State bureaucracies have their own internal dynamic—a bureaucratic hegemonism—which leads to a further expansion of the state and the purview of state bureaucracies.

Finally, though entrusted with the redistribution of resources at its disposal or under its control, because the state exists within society, those employed by the state may be called upon to use their authority to benefit those with whom they share communal affiliation. While this may simply be a timely conveyance of information, or isolated cases of nepotism, bribery, and the currying of favor, it may also involve more systematic forms of internal partitioning based on class, caste, race, gender, or regional origin.

SYNTHETIC MODELS

The model of industrial organization and labor systems that emerges from these assumptions and conditions gives priority to social factors. While this does not preclude a political-economic perspective, it attempts to avoid the ecological fallacy of equating class structure with social structure and market behavior with social organization.

With these requirements in mind, a twofold presentation of relationships between economy and society that, in turn, influence the organization of labor and industry is here offered. The first presentation provides a model of market regulation. The second shows relationships between different forms of production and socio-organizational factors.

While maintaining their own internal integrity based on the need for a rational accounting of costs and benefits, markets operate within a rich social and administrative con-
text that regulates and organizes activities within them (Figure 2.2). Communal systems, predominantly based on reciprocal exchange, provide one base. Associative systems, predominantly based on redistributitional exchange, provide another.

A characteristic feature of urban-industrial societies is the increasing role of the state in regulating market activity. The various laws and administrative procedures used for this purpose, such as contract law, labor law, land-use laws, and environmental protection laws, set boundaries and conditions on broad groups of activities in markets for land, labor, and capital. Yet because associative and communal systems are organizationally separate, areas of noncohesion develop over time. These are areas where the market may be regulated by both the legal-administrative apparatus and communal forms of regulation. Because these systems do not match, tension exists between them. This tension results in actors applying different sets of rules to the same market transactions and leads to potentially exploitative relationships. Finally, there also exists a wide area of unreported or illegal activity. While some of this activity is sanctioned by society and actively rooted out, others, though officially sanctioned, are overlooked. Like Bromley and Gerry's example (1979) of illegal markets in Colombia, the basis for oversight may be lack of popular support, in general, or preservation of the interests of well-connected insiders, in particular. In either case, how-

Figure 2.2 Model of market regulation
ever, although these activities may be unreported, they are not unregulated.

The potential forms of production that result from the interplay of associative, communal, and market factors generally fall into three categories: Fordist, flexible, and communal (Figure 2.3). Fordist production systems, characterized by mass production, an organized and regulated labor force, and state intervention, fall into the predominantly associative side of social regulation. In the socialist version of Fordist production, the state has typically taken a direct role in planning, investment, and redistribution of surplus. In the capitalist version, the state has taken on a largely regulatory role (Aglieta 1987), accommodating the expansion of wage relations, providing macroeconomic support through monetary and Keynesian consumption-oriented policies, and governing the modes of competition.

Flexible specialization is characterized by two forms as well. One form exists within a single firm or worksite and is composed of a restructuring of work relations that is performance based, team oriented, and opposed to union regulation. In this team model, workers are trained for a variety of skilled tasks among which they can be rotated; labor is managed by performance groups (Pelaez and Holloway 1990), and product cycles are shortened through a restructuring of control hierarchies and use of “just in time” subcontractors. The second form of flexible specialization is composed of small firms connected through interlocking subcontracting relationships with lead firms organized to respond to market in-

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**Figure 2.3** Model of industrial organization
stability by targeting smaller, more rapidly changing market segments (Piore and Sabel 1984).

Both versions of flexible specialization rely on communal and associative regulatory mechanisms. In the former, communal factors are most obvious in the performance group. They are not so obvious, though present, in relations between central firms and subcontractors, many of whom are former employees or have long-term relations with the central firm.23 In the latter form of flexible specialization, the effective operation of nonmarket, communal factors across a range of firms within a production network are imperative if the firms are to collectively compete with larger factory systems (Hirst and Zeitlin 1991). This is indeed the case in northeastern Italy where production groups operate within a system in which rapid changes in product lines are paralleled by equally rapid changes in productive relations between firms (Mingione 1991). In this situation, the anticipation of reciprocity—a sharing of benefits and costs—is essential.

Communally supported systems exist within the household, kinship group, or ethnic, religious, or territorial community. While some flexible specialized production networks can also be considered communally supported, the distinction made here is that participation in a particular community serves as the basis for entry into the labor process. Typical communally supported systems include Korean-American green grocers, Jewish-American diamond merchants, and Cuban-American apparel manufacturers (Fernandez-Kelly and Garcia 1989).

On the outskirts of these regulated production systems are illegal, unreported, or underreported activities, which, though they may not appear to be regulated, in fact draw on communal and associative regulatory systems. Employees of large capitalist firms, using skills and equipment obtained in the workplace, may do home piecework for the firm, relying on family and friends for additional labor. In the socialist economies of Eastern Europe, second economies developed based on materials and goods pilfered from the workplace and distributed through communal networks (Mingione 1991).
In an ideal-typical sense, relations between each of these productive systems are allied with corresponding changes in the relative importance of communal and associative socio-organizational factors in regulating market-competitive behavior. Preindustrial societies, for example, are characterized by high levels of communal regulation, low levels of market-competitive behavior, and low levels of regulation through associative means. Industrialization and urbanization, by increasing the density of social interaction and introducing a new pantheon of productive relations, are marked by increasing levels of market-competitive behavior, use of associative socio-organizational factors in regulating economy and society, and a relative decline in the role of communal socio-organizational factors.

As will be shown in the next two chapters, the recovery industry in place in Hanoi has been largely organized and regulated by communal factors. Membership in a territorial community has provided access to resources, including employment with the municipal sanitation company, a supportive community network that provides housing and other social amenities, and the local state. While this system has operated through the French colonial regime and the more recent period of central planning, it has begun to show signs of stress as the market and the state bureaucracy have intruded on its traditional order. Regarding the former, the withdrawal of the state from major areas of social and economic life during the current transition from central allocation of resources to allocation through markets has increased the amount of labor available to the traditional system, primarily through temporary migration, and opened opportunities for new entrants from outside traditional waste-recovery communities. As to the latter, demands for more effective handling of wastes within Hanoi's increasingly urbanized ecological context have brought about changes in personnel employed at upper administrative levels within the refuse system and an increasing orientation to rational-technical, rather than social, approaches to waste management.
Materials Recovery and Refuse Disposal in Urban Hanoi

A growing concern for sustainability within the rapidly industrializing countries of East and Southeast Asia has turned the attention of researchers, planners, concerned citizens, and government representatives to a myriad of environmental problems associated with urbanization, industrialization, and rising aggregate levels of consumption. Solid waste problems and management strategies have figured prominently in these discourses. For the most part, however, the proposals that have emerged have neglected societal responses to growing problems in producing and managing wastes in favor of primarily technological solutions.

This chapter will describe refuse disposal and waste-recovery systems in place in Hanoi, Vietnam, during the summer of 1992. It pays particular attention to social, ecologic, and economic factors in producing and managing solid waste. As such, it provides empirical credence to various analytic themes introduced in the previous chapters. Foremost among these are conceptualizations of the role of communal factors in organizing and regulating markets.

Solid waste management in Hanoi is undertaken by two separate but articulated systems. Refuse disposal is the primary concern of the Urban Environment Company (URENCO), a publicly funded corporation under the Hanoi People's Committee. The refuse system operates under ecologic pressure, driven primarily by urban public health concerns. Waste recovery is the concern of a loose network of collectors, buyers, and traders. The recovery system operates under economic
pressure motivated by demand for recovered materials and the income needs of the labor force. The two systems exist alongside each other, sharing access points, sources of materials, and, because of a historical connection, communal roots.

REFUSE SYSTEM

Organization
URENCO, Hanoi's primary refuse handler, is responsible for the collection, processing, and disposal of wastes within a 41-square-kilometer area of the city. It carries out its duties through an interdependent network of ten semiautonomous enterprises (Figure 3.1) organized into four Environment Enterprises, two Refuse Transport Units, a Nightsoil Collection Unit, a Street Washing Unit, a Mechanical Workshop, and a Landfill Treatment Unit. Each of these service units has an administrative staff and budget, partly derived from municipal sources and partly from local service contracts.

Environment Enterprises, located in each of the city's four urban districts, are responsible for collecting residential wastes, sweeping streets, and cleaning public toilets. Transport Units provide refuse transport services for each of the Environment Enterprises. Transport Unit No. 1, located on Thuy Khue Street near West Lake, serves the northern half of the city (Ba Dinh and Hoan Kiem districts). Transport Unit No. 2, located on De La Thanh Street in O Cho Dua ward, serves the south (Dong Da and Hai Ba Trung districts). Transport Units are also responsible for collecting wastes from public waste bins and enclosures, the majority of which are in collective housing areas, and for collecting refuse from households, businesses, and institutions, which have contracted for this service, throughout the city.

The Nightsoil Unit collects human waste from public toilets and, on contract, from households, collective housing units, and institutions. It is also responsible for maintaining public toilets. The unit's headquarters, transport depot, and waste-processing area are on a former lake site off Giang Vo Street in Thanh Cong ward.
Figure 3.1 Organizational chart, Hanoi Urban Environment Company
URENCO's Landfill Treatment Unit maintains or operates three dumpsites (Figure 3.2). Bo De, a 4.5-hectare site across the Red River in Gia Lam district, is currently filled and closed although plans are under way to purchase a neighboring fish pond for expansion of the site. Tam Hiep, a 3.5-
hectare site south of the city near the town of Van Dien in Thanh Tri district, is currently filled but, for lack of alternatives, was being forced to accept additional wastes during this research. The site closed when the Me Tri landfill, a 4-hectare site located southwest of the city, was completed in 1993.

URENCO headquarters, which contains the offices of the general director, the three deputy directors, and the central planning, public relations, administrative, and technical offices, are located on Cao Ba Quat Street in central Hanoi.

Labor Force

In 1991, URENCO employed 2,678 men and women (Table 3.1). The majority, roughly 57 percent, was employed in refuse collection. Of this group, about 80 percent were employed as street sweepers.

The majority of URENCO's labor force works out of the four Environment Enterprises. The exact number of employees in each of the enterprises varies but averages 475 employees each (26 are office workers, 355 street sweepers,

<table>
<thead>
<tr>
<th>Type of worker</th>
<th>Number of workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refuse collectors</td>
<td>1,530</td>
</tr>
<tr>
<td>Night-time collection</td>
<td>1,082</td>
</tr>
<tr>
<td>Day-time collection</td>
<td>150</td>
</tr>
<tr>
<td>Night-time waste loading</td>
<td>214</td>
</tr>
<tr>
<td>Day-time waste loading</td>
<td>62</td>
</tr>
<tr>
<td>Contract waste loading</td>
<td>22</td>
</tr>
<tr>
<td>Human waste collectors</td>
<td>483</td>
</tr>
<tr>
<td>Public toilet cleaning</td>
<td>378</td>
</tr>
<tr>
<td>Human waste collection</td>
<td>105</td>
</tr>
<tr>
<td>Vehicle drivers</td>
<td>183</td>
</tr>
<tr>
<td>Refuse transport trucks</td>
<td>139</td>
</tr>
<tr>
<td>Tractors</td>
<td>2</td>
</tr>
<tr>
<td>Bulldozers</td>
<td>4</td>
</tr>
<tr>
<td>Street-washing tankers</td>
<td>19</td>
</tr>
<tr>
<td>Human-waste vacuum tankers</td>
<td>19</td>
</tr>
<tr>
<td>Vehicle repair and mechanical workers</td>
<td>65</td>
</tr>
<tr>
<td>Administrative and office workers</td>
<td>417</td>
</tr>
<tr>
<td>Total</td>
<td>2,678</td>
</tr>
</tbody>
</table>

and 94 public toilet cleaners). The percentage of women employed in each of the enterprises also varies though in each instance women comprise more than 90 percent of enterprise staff. Nearly all of URENCO's 1,420 street sweepers are women.

**Labor Processes**

URENCO uses three methods of refuse collection, each tied to a particular set of sources or collection points (Figure 3.3). In the old urban area, sweepers collect refuse directly from households or from piles along streets using a long-handled shovel, a broom, and a hand cart. The majority, between two-thirds and three-quarters of the city's street sweepers, works during the evenings. Most begin their tasks between 5 and 6 P.M., working their way from the inner streets and alleys to the city's main arteries. Residents in the back alleys either pile refuse outside their homes or deposit directly into passing refuse carts.

![Figure 3.3 Hanoi's public refuse system](image-url)
By 8 p.m., most of the refuse from the back alleys and smaller streets has been collected and tipped at a temporary dumpsite. In 1992, there were sixty-two temporary dumpsites in the city, about one-half of which were located at official markets. Fully loaded carts are taken to these sites and tipped in two parallel lines. Loading crews, also mostly women, hand-shovel refuse onto waiting flatbed trucks.

In Hoan Kiem district, hand carts are used along with rear-loading hydraulic lift trucks.28 Sweepers bring refuse collected from households and streets to one of the seventy-two transfer points within the district. Trucks used within the district are equipped with hydraulic lifts. Refuse carts are hooked onto these lifts, raised, and tipped into the rear compartment of the trucks, a process that eliminates the need for temporary dumpsites and loading crews.

Residents in the 1,075 blocks of flats in the twenty-five collective housing areas to the south and west of the old urban area are required to deposit household wastes at a central collection point. URENCO maintains 166 metal waste bins for this purpose. The company uses a variety of side-loading and flatbed trucks, all equipped with hydraulic lifts, to empty or exchange waste bins daily. Truck crews are typically comprised of a male driver and a male lift operator.

Industrial, retail, institutional, and special household waste is collected on an individual contract basis. Each Transport Unit employs a crew for this purpose. It is not clear, however, how these contracts are negotiated. Apparently URENCO's central office handles the paperwork, district enterprises negotiate with the sources, and Transport Units carry out the work. If this is the case, like other joint activities in URENCO, the fees from special contracts must be divided among parties.

Treatment

Current At the time of this study, all refuse collected in the city was taken to Tam Hiep, URENCO's controlled dumpsite about 9 kilometers south of the city. The site is not isolated from the surrounding area by either a clay liner or a berm. As
a result, frequent flooding in the area has caused problems through the intrusion of leachate on adjacent fields and ponds. In early July 1992, one such incident, which destroyed rice and fish grown by a neighboring cooperative, cost URENCO about $3,200 in fines.

Refuse is tipped on the surface of the dump at Tam Hiep, flattened by bulldozers, and covered with dirt. As in the city, the most intensive work is carried out at night as trucks deliver refuse collected from temporary dumpsites throughout the city.39

**Future** URENCO currently does not serve areas more than 150 meters from a main road unless they can be reached by a cross lane. This policy leaves many urban villages in Ba Dinh, Dong Da, and Hai Ba Trung districts without regular refuse collection. URENCO intends to remedy this situation by initially employing a village resident to transport refuse to an accessible transfer point. These activities will be coordinated by ward-level People’s Committees. Eventually, however, URENCO would like the Hanoi People’s Committee to use its power of eminent domain to purchase rights-of-way through these villages. Under this plan, the Hanoi People’s Committee would purchase more land than required in the anticipation of selling unused portions to cover its costs.

Furthermore, considering the success of mechanized residential and street waste collection in Hoan Kiem district, URENCO planners intend to transfer the waste cart and hydraulic lift-truck technology to the remaining three urban districts. Such a move would eliminate temporary dumpsites, considered a public health hazard and nuisance by URENCO administrators and the city’s residents, and replace them with temporary storage in waste carts. The move would also reconfigure work schedules, placing a more even distribution of the workforce between night and day shifts. By the end of 1993, all four urban districts were mechanized.

Finally, URENCO has initiated a plan to construct or improve four landfills and three composting plants, to the
Table 3.2 Proposed landfills and composting plants

<table>
<thead>
<tr>
<th>Area</th>
<th>Transfer site</th>
<th>Landfill</th>
<th>Composting plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>South</td>
<td>Yen So*</td>
<td>Yen So</td>
<td>Tam Hiep (small plant)</td>
</tr>
<tr>
<td>East</td>
<td>Gia Lam</td>
<td>Gia Lam</td>
<td>None</td>
</tr>
<tr>
<td>West</td>
<td>Me Tri</td>
<td>Me Tri</td>
<td>Cau Dien (pilot plant)</td>
</tr>
<tr>
<td>North</td>
<td>Gia Lam</td>
<td>Dong Anh</td>
<td>Dong Anh (large plant)</td>
</tr>
</tbody>
</table>

Source: URENCO, personal communication.

* Hanoi's most important source of fish, supplying 86 percent of the fish consumed in the city (Sy n.d.).

north, south, east, and west of the city, over the next ten to fifteen years. At some time in the future, beyond this time period, URENCO would also like to construct an incinerator.

The locations of the proposed landfills and composting plants are listed in Table 3.2. Each of the four landfills will also serve as a transfer station and provide a point for pre-sorting refuse.

A pilot composting plant, funded by a grant from the UNDP and the Hanoi People's Committee, has already been constructed. The $800,000 project, which has been built on a 2.7-hectare site in Cau Dien (Figure 3.2), a suburb along the Nhue River 13 kilometers to the west of central Hanoi, is projected to convert 30,000 cubic meters of organic wastes and 1,750 cubic meters of sewage sludge into 7,500 cubic meters of organic compost annually. The site on which the plant is being constructed was formerly used as a pig farm and small composting plant, also operated by URENCO.

Refuse Characteristics

Generation URENCO's estimate of daily solid waste generation, 1,980 cubic meters per day (URENCO 1991), is produced by multiplying an estimate of the population within the service area by an estimate of yearly per capita waste generation (Table 3.3). For administrative purposes, URENCO uses a resident population figure of about 990,000 persons and a yearly per capita generation rate of 0.6 cubic meter. This yields an average citywide waste generation rate of approximately
1,623 cubic meters per day. Adding the wastes produced by about 10,000 visitors within the city on any given day raises this to an estimate of 1,980 cubic meters per day.

**Collection**  URENCO estimates its collection rate by multiplying the number of trucks in service by the number of trips per day and the average capacity per vehicle. Since the capacity of vehicles varies as does the number in service on any given day, this calculation can be quite complex. In an article printed in *Van Nghe, Chien* (1992) attempted to explain this method of estimation using the following rough formula:

$$108 \text{ vehicles} \times 10 \text{ m}^3/\text{vehicle/day} \times 0.8 \text{ efficiency rate} = 864 \text{ m}^3/\text{day}$$

This estimate is slightly less than URENCO's of 910 cubic meters per day, which is likely to be less than the actual amount collected. Based on estimates provided by the directors of the four Environment Enterprises, the enterprises alone collect 848 cubic meters per day. When added to the amount collected regularly by the two Transport Units—from waste bins and, on contract, from businesses and households—the total amount collected must be well over 1,000 cubic meters per day.

Nevertheless, considering an official generation rate of 1,980 cubic meters and a collection rate of 910 cubic meters per day, approximately 1,070 cubic meters of refuse produced

<table>
<thead>
<tr>
<th>Table 3.3 Solid waste generation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Waste source</strong></td>
</tr>
<tr>
<td>Estimated resident population: 987,325</td>
</tr>
<tr>
<td>Per capita generation rate</td>
</tr>
<tr>
<td>Estimated total generation</td>
</tr>
<tr>
<td>Estimated visitor population: 10,000</td>
</tr>
<tr>
<td>Per capita generation rate</td>
</tr>
<tr>
<td>Total generation</td>
</tr>
</tbody>
</table>

Note: 1 cubic meter equals 0.41 metric ton (URENCO 1991).
within the city each day is not collected or treated by URENCO (Table 3.4).

**Composition** The composition of solid wastes in Hanoi varies by season and location (see Table 3.5). In areas with higher standards of living, paper and glass form a higher proportion of the waste stream. In working class neighborhoods, there is more vegetable matter and coal ashes. From July to October, however, leaf, fruit, and vegetable components are generally high throughout the city. The leaf content is particularly high in Hoan Kiem and Hai Ba Trung districts where most streets are tree-lined. In winter, the fruit and vegetable content drops significantly.

During the Vietnamese New Year season, political conferences, and on the first and fifteenth day of each month of
the lunar calendar, the volume of wastes is also higher. The last event is a result of religious practices that require households to pay respect to ancestors with offerings of food, "hell" money, and paper gifts.

RECOVERY SYSTEM

Organization

The recovery system in Hanoi is loosely organized around a three-tiered network of collectors, buyers, and traders (Figure 3.4). Collectors gather materials from three groups of sources, two predominantly public and one predominantly private, and sell their materials to buyers at dumpsites, along sidewalks, or in shophouses. Buyers—and for some materials, collectors—sell to traders operating within the city or in...
Trieu Khuc, a suburb of Hanoi. Because of the volume of materials they handle, traders are able to more finely grade and process materials than buyers. This allows them to sell to larger local industrial users and export to foreign dealers or industries.

The three levels of Hanoi's recovery system are divided into six occupations. The collection level is filled by scavengers and junk buyers. Separate groups of scavengers operate within the city and at the municipal dump. Junk buyers operate only within the city. The purchasing level is filled by depot operators and receivers. Like scavengers, separate groups of depot operators work within the city and at the municipal dump. Receivers work out of fixed locations within the city. The trading level is filled by dealers and agents. Dealers typically operate out of centrally located sites whereas agents often work directly for industries.

One characteristic of Hanoi's recovery system is the fluidity of relations between buyers and sellers. While scavengers working at the municipal dump generally sell to depot operators working there, within the city, there is a large degree of trading within and between levels based on either particularistic relations between buyers and sellers or, simply, convenience. Nevertheless, distinct levels exist and are defined by the volume of materials traded, distance from waste sources and the social stigma attached to them, capital requirements, and higher standards of living.

Labor Force
The number of people employed in the recovery industry, which fluctuates with the seasons, reaches a peak of more than 6,000 in early August. A majority are employed as the initial collectors of recoverable materials. About 5,775 scavengers and junk buyers were working within urban Hanoi during the peak of the waste season in 1992 (Table c.1). An additional 200 scavengers were working at the municipal dump in Tam Hiep.

The labor force appears to be divided slightly in favor of junk buyers (Figure 3.5; Table c.2). The three largest groups
within the labor force were those under twenty years old (25.5 percent) who were working as scavengers (18.8 percent) and male (10.1 percent). Adult males were highly underrepresented in the sample (31 percent) compared to adult females (44 percent).

No systematic investigation of the number, gender, and ages of depot operators, receivers, dealers, and agents was carried out. Interviews, observations, and anecdotal evidence suggest, however, that like other occupations in the recovery industry, these occupations are largely filled by women. This is especially true for depot operators.

**Collection**

The first level in the waste-recovery hierarchy is occupied by scavengers and junk buyers. These two occupations, while similar in their function in the industry, are distinctly different in sources, materials, equipment, and need for working capital. Scavengers rely heavily on public sources, have little need for working capital, use simple tools, and collect generally low-quality materials. Junk buyers collect higher quality materials direct from private sources, require daily working capital, and use more complex tools.

A further distinction has to be made between scavengers working within the city and those working at the municipal

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*Figure 3.5*

Age and gender distribution of sample (by occupation)
landfill. Those working within the city are a mixture of temporary migrants and Hanoi residents, whereas those at the landfill are almost exclusively residents of nearby villages who use the dump as a source of income and subsistence.

**Scavenging Within the Urban Area** Two types of scavengers work within the urban area. *Người bỏ rác*, waste diggers, use an iron hook (móc sâl) to extract recoverable materials from waste piles, bins, and refuse carts. *Người nhặt rác*, waste pickers, use long bamboo tongs (que gắp) to gather loose paper, plastic, and aluminum cans from gutters and temporary dumpsites. Although there is some interchange between methods, waste diggers are numerically dominant.

Other tools used by scavengers include panniers, handbags, and baskets (Table c.3). Panniers (quang gánh) are the typical transport tool used by peasants to haul materials over short distances. They are made up of a bamboo shoulder pole from which two baskets are hung. Although styles vary, the typical arrangement uses shallow baskets about 75 centimeters (30 inches) in diameter.

Baskets (rổ) are generally used by young girls and women and are carried at the side while collecting and on the head while transporting. Handbags (túi) are generally used by young boys, who suspend them from the handlebars of their bicycles as they dig through sources along their routes. Since the capacity of both handbags and baskets are limited, scavengers need to make frequent stops at collection and storage points during their workday (Case 3.1).

Competition for materials among scavengers is limited through work schedules, occupational etiquette, and division of labor. Women and girls, using side-carried baskets (rổ), work from roughly 6 A.M. to 12 noon and have customary work areas, routes, and collection sites. Young men and boys, using bicycles and handbags (túi), go out between 5 P.M. and 1 A.M. and search through URENCO’s temporary dumpsites. Although work areas often overlap and the division of labor is often abrogated, the labor processes of the trade result in few territorial conflicts. Specifically, since scavengers do not
Case 3.1 Scavenging Around Hanoi University

About thirty scavengers and junkwomen work in the area around Hanoi Polytechnic University. This area, bordered by Bach Mai Street to the east and a curve in the Set River to the west, north, and south, is rich in high-quality wastes from the university, its dormitories, a commercial district, and several collective housing areas.

One group of fifteen scavengers and junkwomen arrive at 6 A.M. daily. The majority is under twenty years old and female. All the girls in the group use iron hooks and carry a basket at their side. The boys also use iron hooks but ride bicycles and use handbags suspended from the handlebars to carry collected materials. Most of the women, who are the elder sisters, cousins, and aunts of the children, use hooks and baskets, as do the girls. Some, however, who work as miscellaneous junk buyers, use a scale and pannier.

The fifteen people are divided into three kinship groups. All come from the same village in Xuan Thuy district in Nam Ha province. Together, they arranged to share the space around an unused kiosk abutting the wall of the university's sports field. They share this space with a barber and a bicycle repairman.

Between 6 and 11 A.M., the children search through the streets, waste bins, and temporary dumpsites in the neighborhood. They return to the kiosk periodically—about every half-hour—to deposit their goods. Each family group stores its daily cache in large sacks tied to lamp posts.

At about 11 A.M., the entire group returns to the kiosk to sort through their materials. Some materials are processed on the spot—plastic is separated from metal pieces and aluminum tops are cut from steel beverage cans—but the bulk of effort goes into sorting and packing. Plastics go into one bag, glass another. Scrap metal, paper, and cardboard are bundled. Pieces of wood and bamboo, collected for use as cooking fuel, are tied in bundles as well. One woman, who specializes in bone, arranges her daily cache of 60 to 80 kilograms into three sacks. Two will be hung on the sides of her bike and one will be laid over the rear wheel.

After taking time to rest and socialize, the group heads off to make their sales. Before leaving the kiosk area, one of the young girls will sweep up any debris into a curbside pile. Some children linger behind to talk, read magazines, and eat ice cream purchased from an itinerant vendor. Each family group has its own bicycle for use in transporting materials to market. When loads are too large, however, young girls carry baskets of sorted materials on their heads.

The group makes its first stop at Dai Co Viet, about 1 kilometer from the kiosk, where they sell some scrap metal, glass cullet, and bottles. They then move on to O Cho Dua ward, where they sell paper, plastics, and bone.

linger over refuse piles, waste bins, and temporary dumpsites but rather collect from top layers and move on, multiple users can draw from the same sources.
Scavengers at the Municipal Dump  Scavenging at the municipal dump involves labor processes, working conditions, living conditions, and social relations similar to, though different from, the same processes, conditions, and relations found in scavenging within the city. These differences result from the working relationship between the dump and on the farm and the lower quality of materials collected at the dump.

A majority of the estimated 200 people working at the municipal dump are residents of the nearby village of Tam Hiep.31 Like scavengers working in the city, a high proportion are women and children, most of the latter working after school. Many work in family groups with mothers or older sisters supervising younger children.

Unlike scavengers within the city, many of whom work only during the agricultural off-season, those working at the dump scavenge concurrent with work on-farm. This connection allows them to use the dump not only for generating income through the sale of marketable waste materials but also as a source of farm inputs.32 Among the materials collected for farm use are leaf waste used as green manure, firewood used for cooking fuel, and dead animals used as pig food.

Those materials collected for sale are of generally lower quality and lower value than materials collected within the city. The reason for this has more to do with the position of the dump in the waste-disposal system than to direct exploitation by buyers. Because much of what is valued has been removed either by junk buyers at the source or scavengers working within the city, those materials arriving at the dump are generally broken, are contaminated by other wastes, require too much time to collect when not concentrated at a single source, or are bulky. As a result, common materials collected at the dump include things such as aluminum pull tabs, latex vapor seals pulled from bottle tops, bicycle tires, mixed waste paper, dirty plastic bags, and broken glass.

Like scavenging in the city, scavenging at the dump occurs in two shifts. The night shift begins at about 7 P.M., as the evening's procession of dump trucks begins to arrive, and
continues until 2 A.M., when URENCO’s workers go off duty. Scavengers congregate around the arriving trucks, then circle the piles of tipped refuse, using a burning bicycle tire for light and an iron hook to dig through the pile. Because of the mud at the dumpsite, most wear rubber boots.

The morning shift begins some time before 7 A.M., when the URENCO bulldozer operator arrives to work and levels the previous evening’s piles. Vinh Ninh villagers are the first to arrive, some as early as 4 A.M. Others from the village, along with nonresidents, arrive between 6 and 7 A.M.

Most materials are immediately sold at dumpsites. Some of the Vinh Ninh villagers, however, transport materials to the nearby village where they are sorted and processed.

**Junk Buyers** Junk buying is characterized by the purchase, rather than collection, of waste materials. Since most are purchased from their sources, junk buyers generally deal in clean wastes. In addition, because junk buyers use sales to finance purchases, they dispose of materials more rapidly than scavengers. Although this allows junk buyers to trade in larger volumes, the need for working capital forces some into credit arrangements that tie them to depot operators, receivers, or dealers.

Unlike Vietnamese terms for scavenging, which refer to specific labor processes, the term generally used for junk buying has its origin in reference to a specific material. In northern Vietnamese, the term applied to the occupation, người dồng nât, can be literally translated as “scrap metal people.”

In general terms, scrap metal is the material most frequently collected by junk buyers (Table C.4A), followed by bottles and aluminum cans, plastics, and paper. Households are the single, largest source of these materials (Table C.5). About 77 percent of the junk buyers in the sample purchased materials from households. Other important sources include restaurants, institutions, and hotels.

Since materials gathered from these sources must generally be purchased, and since many are valued by weight, the most common tool used by junk buyers is the scale (Table
Roughly 68 percent of the junk buyers surveyed regularly used scales (cân). By comparison, only 4.5 percent of the scavengers surveyed used scales.

The second tool most frequently used by junk buyers, the pannier, is tied to a particular labor process. Use of a pannier (quang gánh), an effective transport tool over short distances, requires frequent stops at collection points where materials can be stored or sold. As a result, the most common outlet for goods purchased by junk buyers is the sidewalk depot (Table c.6).

The importance of depots as a point of sale underscores the relationship between depot operators and junk buyers. Some depot operators provide working capital in exchange for rights to the materials collected by junk buyers. While these arrangements tie a junk buyer to a particular depot operator, they also increase the amount of materials junk buyers are able to purchase. Wary of the implications of such credit arrangements, many junk buyers distribute their obligations among several depot operators, receivers, or dealers.

**Gender Divisions Among Junk Buyers** The data on junk buyers clearly reveal gender divisions within the occupation, which are evident in the types of materials collected, equipment used, sources from which they are purchased, and points of sale.

As for type of materials purchased, though junk buyers generally collect a miscellany of materials, junkwomen are more likely to do so than junkmen. Between 64 and 90 percent of the junkwomen in the sample collected a variety of common materials, whereas 79 percent of the junkmen collected only scrap metals with high frequency. Although this compares favorably with junkwomen, of whom 74 percent collected scrap metal, the portions of all other materials collected varied widely. Ninety percent of the junkwomen collected paper compared to only 42 percent of the junkmen; 65 percent of the junkwomen collected carton compared to only 26 percent of the junkmen (Table c.4A).

Junkmen also specialize more frequently than junkwomen. Only 6.5 percent of the junkwomen specialized
compared to 42.1 percent of the junkmen (Table c.4b). The dominant specialization among junkmen was in scrap metal (50 percent of specialists).

A similar gender division is evident in tools used by junk buyers. Although the two tools most frequently used by junk buyers were scales (68.1 percent) and panniers (66.7 percent), these tools were more likely to define the work of junkwomen than junkmen. Panniers were used by 80 percent of the junkwomen in the sample compared to 42.1 percent of the junkmen (Table c.3). Roughly 71 percent of the junkwomen and 63 percent of the junkmen in the sample used scales.

Junk buyers also frequently used bicycles (xe dap) and cargo bikes (xe thọ). Roughly 52 percent of the junkmen sampled used bicycles and 47 percent used cargo bikes. By comparison, 11 percent of the junkwomen sampled used bicycles and 4 percent used cargo bikes.

Material sources reveal a gender division in occupation as well. Women were more likely to collect from noncommercial, low-value sources than men (Table c.5). Fifty-nine percent of the junkmen in the sample purchased materials from restaurants, 31 percent from institutions, and 29 percent from hotels. Only 34 percent of the junkwomen purchased materials from restaurants, 23 percent from institutions, and 14 percent from hotels. Women were also more likely to collect from streets.

Finally, gender divisions carry beyond the labor processes of occupation into relations of exchange: 68.4 percent of the junkwomen in the sample sold materials at sidewalk depots compared to only 35.3 percent of the junkmen. Roughly 42 percent of the junkwomen sampled sold only at sidewalk depots compared to 12 percent of the junkmen. By comparison, 71 percent of the junkmen sampled sold their goods at specialized shops compared to 40 percent of the junkwomen.

These data reveal that women are more likely to be employed as itinerant miscellaneous waste materials buyers than men, who are more likely to be employed as specialized
waste materials buyers. Women walk their routes carrying a pannier and scale, purchasing primarily from households and selling primarily to sidewalk depot operators who are mostly women. Men circulate through the city on bicycles, purchasing clean materials from commercial and institutional sources and selling them in specialized shops.

**Purchase**
Depot operators and receivers fill the next level in the recovery hierarchy. In Vietnamese they are called *người thu mua đồng nat* (people who buy scrap metal) or *người thu mua phế liệu* (people who buy discarded things). As noted in the definition of terms for junk buyers, *đồng nat* has come to include a wider range of materials than its literal meaning, scrap metal, suggests. The verb in this clause, however, requires some explanation. As used during the planned economy period, *thu mua* meant to “make compulsory purchases” (Le 1992) and referred to state purchases from cooperatives. In its contemporary meaning, however, it conveys the idea of stockpiling.

**Depots**
Depots are located both within the city and at the municipal dump. Those operating at the dump tend to specialize in particular materials and purchase primarily from scavengers. The volume of materials thus purchased may be high, but the quality is often low. Dumpsite depot operators, who set up shop along the edges of the landfill, arrive in the morning to make purchases and leave in the late afternoon when their goods have been sold to dealers or packed for transport.

Most depot operators working in urban Hanoi trade in miscellaneous materials, primarily brought to them by itinerant junk buyers. As noted, junk buyers, who use depots as convenient drop-off points, are often tied to depot operators through credit relationships. Although these trading relationships allow junk buyers to increase the volume of materials they are able to purchase, they also allow depot operators to collect rent on loaned capital. Furthermore, since advances on working capital are repaid in goods, these arrangements also ensure depot operators with a minimum supply (Case 3.2).
Case 3.2  A Depot Operator on Le Van Huu Street

Huong, a woman in her mid-twenties, operates a depot on Le Van Huu Street, in the French Quarter of Hanoi. Her depot is one point in an extensive family business. She is assisted on Le Van Huu Street by a younger sister. A brother operates a depot on Ngo Thi Nham, nearby. Two younger sisters work as junkwomen in Dong Da district.

Huong's husband drives a pedicab. He uses the pedicab to transport goods collected through the family's enterprise back to Trieu Khuc Village, near Ha Dong, where Huong's parents operate a waste-trading business. Trieu Khuc, a major waste-trading center, is too distant from the city center for scavengers and junk buyers to transport their goods independently. By placing satellite operations in the city, the family can actively work to ensure its supply.

Huong's operation is not small, despite its appearance. She requires 5 million dong ($463) in daily working capital. Part of this is extended as credit to a few trusted junk buyers in exchange for delivery of part of their goods to the depot. The remainder is used for spot purchases.

For her efforts, Huong earns between $55 and $65 per month.

The overwhelming majority of depot operators both within the city and at the municipal dump are women. Women are, however, only the most visible members of larger household enterprises. Sorting, washing, and grading are often done by children at home. Young boys may also pack and load while girls manage the tasks. Husbands or older males may work as porters, using bicycles or pedicabs to move goods between depots, homes, dealers, and workshops.

Receivers  The major difference between depot operators and receivers is that, while most depot operators work along sidewalks, most receivers work out of fixed locations. Although this distinction may appear superficial, it results in a wide range of variance in terms of clientele, capital requirements, degree of specialization, and labor relations.

Because they operate out of fixed locations and do not have the advantage of proximity to sources that depot opera-
tors have, receivers are forced to develop a regular clientele in order to ensure a steady supply of materials. This need creates competition among receivers for the loyalty of the scavengers and junk buyers who supply the materials they trade. Some receivers develop these relationships as depot operators do, through the extension of working capital to trusted clients. Those with larger scale operations may offer ceremonial gifts, cash advances, housing, and other social services as well (Case 3.3).

Depot operators primarily buy materials from itinerant junkwomen, whereas receivers are more likely to buy from scavengers or junkmen. The reasons behind this relate both

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**Case 3.3 A Receiver in O Cho Dua**

Be operates a receiving shop in O Cho Dua. She has been in business for about two years. She was formerly employed by the state map-making institute. Her parents and grandparents were employed in the waste trade for thirty to forty years. When she was forced into retirement from her job with the state due to budget cuts, she turned to her family's trade for work.

Be purchases miscellaneous wastes from scavengers and junk buyers working in the city. She has a regular clientele of between 100 and 120 scavengers, many of whom live in dormitory space that she provides. Nine other households in the area regularly purchase from scavengers and three purchase from junk buyers.

A majority of her clients are natives of Xuan Thuy, as she is. She sees her work as assistance to fellow villagers (dông hưởng) in need. She regularly extends credit to her clients so that they can make large purchases and sends gifts to the countryside with returning scavengers. She says she does this because she wants to maintain long-term relationships with her suppliers. This is also the reason for providing housing. Be says that when scavengers return home from visits to the countryside, they are forced to give up their place in the boardinghouse where they have been residing. When they return to Hanoi, they must find new accommodations. Since scavengers end up selling to the owner of the boardinghouse where they reside or to the nearest receiver, it is to her advantage to provide reserved accommodations. Her clients repay her with gifts and ceremonial offerings from the countryside.

Be's husband operates a scrap metal shop nearby. Her sister-in-law, whose shop is adjacent to hers, is one of Hanoi's major bone dealers. Be's 13-year-old daughter does some waste-materials processing, raises pigs in the family's living quarters, and handles business in her mother's absence. She is also responsible for most of the housekeeping. Be's two sons (aged ten and seventeen) have less contact with the business. Besides packing and loading, the sons invest most of their energies in studies.
to relationships between receivers and their suppliers and to
gender partitioning within the trade. Junkmen often specialize in materials like scrap metal and bottles that are traded out of fixed location shops operated by receivers. Scavengers, however, are generally young, mostly female, and depend on others for housing, cash advances, and protection from civil authorities. Some receivers provide these services in exchange for the right to purchase materials collected by their tenants.

Some of the larger receivers hire workers to process materials. They may be paid by piece or by the month and may also receive meals and clothing. For example, one receiver in O Cho Dua who paid two women 10,000 dong ($0.93) each per 10 kilograms of washed and dried plastic bags also paid a monthly salary, plus food and clothing, to three people who sorted and graded materials.

Trading
Dealers (người bán lai) and agents (dài lý) fill the highest level of the recovery hierarchy. Currently, waste recovery in Hanoi, because of the diversity of material sources, requires dealers and agents to maintain relations with suppliers from all levels of the recovery hierarchy. Some of them operate solely in the upper circuit of the recovery system, furthest removed from sources of "dirty" wastes, and are most likely to trade with large industrial users.

Dealers
Dealers usually work out of fixed locations and buy specific types of materials. Their sources include both the lower circuit of the recovery system (junk buyers, depot operators, and receivers) and industries, businesses, and institutions. Because their position in the hierarchy allows them to supply large orders, dealers tend to have the best connections with high-volume domestic and international industrial users and traders.

These trading relationships also require them to maintain large, secure storage spaces and locate on or near major transport routes. For this reason, many of Hanoi's major dealers are located at nodes along the city's ring roads. Several
scrap metal and bottle dealers are located on or near Dai Co Viet, the city's inner ring road. The location affords access to both the central city and the major southern route out of the city. Others are located in O Cho Dua ward, on De La Thanh Street, a connecting point to western and northern routes out of the city (Case 3.4).

Neither the dealers operating out of Dai Co Viet nor those working off De La Thanh have been able to secure permanent storage space. In September 1992, many of the dealers on Dai Co Viet were evicted when sidewalks were constructed along the ring road. Others nearby were evicted under pressure from primary leaseholders who established joint development agreements with foreign nationals. Even the more secure dealers along De La Thanh face pressure as the next phase of ring expansion threatens to disrupt their businesses.38 Evictions at major trading centers such as these have severe repercussions throughout the recovery system. Supplies of materials directed to industries and export are reduced; new trading relationships must be negotiated; accumulated capital is wasted on relocation costs; and suppliers lose outlets for the goods they purchase or collect. If the system does not recover from such losses, wastes will be permanently diverted from recovery to disposal, causing further burdens on that already overtaxed system.

Sources of materials vary with specialties. Scrap-metal dealers, for example, rarely purchase from scavengers or junk buyers. They rely on supplies from receivers, depot operators, and direct contacts with scrap-metal sources, the most prominent of whom are the Vietnamese military and state construction companies. Bottle dealers, however, purchase directly from scavengers and junk buyers, as well as from receivers and depot operators. In contrast, paper dealers purchase materials directly from department stores and publishers, as well as from junk buyers, receivers, and other dealers.

Because they are able to trade in large volume, dealers are able to supply both domestic and foreign industrial users. Duck feathers gathered in Hanoi are regularly shipped to yarn factories in Hai Phong, as well as to clothing and bedding
Case 3.4 A Scrap Metal Dealer in O Cho Dua

Ngoc, a woman in her mid-fifties, operates a scrap-metal dealership in O Cho Dua ward. She is a native of Xuan Thuy and has been in the waste business for most of her life. In the late 1930s, her parents and grandparents came to Hanoi to work for the Sanitation Company (Cong ty Ve sinh). Ngoc, like the majority of those connected to this business, refers to it as the Nam Diem Company, after the former director, a native of Xuan Thuy who introduced his compatriots to the company and the waste-recovery business. As the single, largest dealer in Hanoi's recovery industry, Ngoc has become the unofficial heir to this legacy.

Ngoc began work scavenging at the Thanh Cong dump, near O Cho Dua, at thirteen years old. At sixteen she began junk buying within the city. By the time she was nineteen, she had established a sidewalk depot and married a pedicab driver. Gradually, over time, she and her husband were able to accumulate enough wealth to establish themselves in a fixed location. She opened a receivership, the first in O Cho Dua, in the early 1960s. At first she dealt in the same kind of miscellaneous materials traded by sidewalk depot operators, but in time, she turned to specialized trade in scrap metals.

Currently, Ngoc's sources of scrap metals are other dealers and receivers, and direct contacts with the military. She says that in the past, many countries helped Vietnam in the war effort. As a result, "there is much aging equipment which can no longer be used."

Ngoc manages the business from "nail to girder," though she says her husband defines strategy. She has several employees who dismantle vehicles. They separate valuable parts for sale to companies that make machinery and sort the remainder into various grades of scrap. The majority of this scrap is sent to foundries in Thai Nguyen province. In 1989, however, Ngoc shipped 3,000 tons of scrap metal to a company in Singapore.

Ngoc pays her workers between 300,000 and 500,000 dong ($28 to $46) per month. Although this is high for Hanoi, Ngoc says she must pay a decent wage to avoid theft.

Ngoc sees herself as a social worker. She says that some districts in Nam Ha are very poor and many people are out of work due to the collapse of cooperative industries. A former president, Mr. Truong Chinh, a native of Nam Ha, made his native district (Xuan Truong) rich. She intends to do the same for her district (Xuan Thuy).

Recently, Ngoc has been involved in an effort to restore historic pagodas in Hanoi and has built a dormitory for Xuan Thuy scavengers. She allows residents from her native district to stay in the dormitory rent-free.

Ngoc says that relatives in Hanoi introduce migrants to the waste-recovery business and that mutual assistance groups assist people from the same village. She said that work in the recovery business contributes hundreds of millions dong to the Xuan Thuy economy annually.
manufacturers in Hong Kong. Scrap metals are shipped to foundries in Thai Nguyen province and exported to Singapore, Taiwan, South Korea, and China. Bottles are returned to local distilleries and shipped to breweries in China where they originated.

**Agents** Agents fill a particular niche in trading as intermediaries between industries and dealers. In the scrap-metal business, some dealers have made agreements with agents who supply them with finished metal products, such as angle iron and reinforcing bar, in exchange for scrap metal collected in Hanoi. These agreements, which reduce trade between dealers and agents to barter, allow the dealer to operate both a scrap-metal collection business and a construction-steel retail business.

The bottle business, however, differs from this pattern in that agents can be either the licensed agents of a product or the trucking agents who transport them. Among the former, the most prominent are agents of the state mineral water cooperative (Nuoc Hoang Kim Boi) who sell mineral water and collect bottles for reuse. Among the latter are several trucking agents in Hanoi whose main interest is in trading beer bottles. The bottles are purchased from dealers in Hanoi, transported to southern China, and sold or bartered for other goods. The trucks return to Hanoi where the goods are sold to distributors.

**ARTICULATION**

The refuse and recovery systems are articulated through common sources of materials, key access points, and relationships between personnel. For those employed in the recovery industry, articulation provides both sources and access. For those employed in the refuse system, it provides for a reduction in refuse that need disposal and, at times, assistance in the burdens of their work.

Figure 3.6, which overlays the refuse and recovery operational charts, illustrates the points of articulation. Briefly, scav-
engers at the dump, at the pilot composting plant, and within the city are most dependent on URENCO collection, transfer, and disposal sites as sources of recoverable materials. This dependence has fostered particularistic relationships between scavengers and URENCO staff. Junk buyers, who rely most heavily on private sources, do not share these direct relationships with URENCO staff, but rather, support URENCO's work by diverting wastes from the disposal stream.

Sources, Access Points, and Personal Relations
Scavengers working in the city rely almost exclusively on public sources. The most prominent of these sources is the temporary dumpsites used as transfer stations. Out of seventy-four scavengers in the sample, 70 percent indicated that they regularly collected from these temporary dumpsites, 64 percent from streets, 64 percent from waste bins, and 35 percent from refuse carts (Table c.5).

This commonality of sources has prompted the development of work relations between some scavengers and refuse workers. It is not uncommon to see a scavenger pushing a refuse cart along the street with one hand on the cart's push bar and the other searching through wastes with an iron hook, while a URENCO employee sweeps the street ahead of the following cart.40 Scavengers living in O Cho Dua ward also regularly solicit return rides from the municipal landfill at Tam Hiep on URENCO vehicles. Residents of O Cho Dua also wash URENCO trucks at one of the ward's ponds.

Diversion of Wastes from Refuse System
During the peak season in August, scavengers and junk buyers divert between 181 and 268 metric tons of materials from the refuse disposal system daily (Table c.7). The value of this diversion is threefold. First, it supplies local industries with needed materials. Second, it diverts large volumes of materials from landfills. Third, by altering the composition of the waste stream, it makes centralized composting of organic matter feasible (Binnie and Partners 1990).
Figure 3.6 Articulation of refuse and recovery systems
Figure 3.7 integrates the volume of materials recovered by Hanoi's scavengers and junk buyers into URENCO's estimates of waste generation and collection. Although recovery does not account for all wastes uncollected by URENCO, it reduces this amount by about one-half.

Scavengers and junk buyers alter the waste stream by removing inorganic materials such as glass, plastic, and metal and organic materials such as paper and bone (Table 3.6). The removal of such high volume or weight materials as bottle, paper, and metal by scavengers and junk buyers raises the ratio of compostible organic materials vis-à-vis noncompostible materials.

**Value**

A rough estimate of the value of the materials collected or purchased by scavengers and junk buyers can be reached by multiplying the average income per person per day (Table c.8) times the population, taking into account seasonal fluctuations in the workforce. The average daily income for all scavengers and junk buyers surveyed in Hanoi during August 1992 was 5,314 dong ($0.492). In general, most scavenger
ing by temporary migrants to Hanoi occurs within a seven-month window between May and December, with a peak occurring between late July and early August.42 During the remainder of the year, a base population of between 2,000 and 3,000 people works in the recovery industry. The lowest point in the cycle occurs during the Vietnamese New Year season when most migrants return to their home villages.

Given an exchange rate of 10,800 dong per U.S. dollar in August 1992, the value of materials collected in terms of income received, at $568,713, is quite a substantial contribution to the urban economy (Table 3.7). This sum, of course, does not consider the additional amounts of income earned by dealers, receivers, and depot operators, nor does it consider income earned by employees and managers of industries dependent on recovered materials for inputs. When these sums are considered, the value of the recovery industry as an urban economic force cannot be dismissed on any grounds.

Equally significant is the value of incomes earned in the recovery industry to the maintenance of rural farm households. Roughly 60 percent of those employed as scavengers and junk buyers in Hanoi are temporary migrants to the city (Table 3.9); at least one-half of them work in the waste trades to supplement agricultural income (Table c.10). Given an average cost of room and board of 3,000 dong43 ($2.8) per day, the potential in savings returned to rural households could

### Table 3.6 Composition of refuse and recovered materials (% by weight)

<table>
<thead>
<tr>
<th>Refuse (URENCO)</th>
<th>Recovered materials (Scavengers and junk buyers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.27 Leaves, fruit, roots, vegetables, and dead animals</td>
<td>27.9 Paper</td>
</tr>
<tr>
<td>2.72 Paper</td>
<td></td>
</tr>
<tr>
<td>6.27 Bags, sticks, and wooden pieces</td>
<td>7.6 Plastic</td>
</tr>
<tr>
<td>0.71 Plastic, rubber, and leather</td>
<td></td>
</tr>
<tr>
<td>1.06 Snail and clam shells</td>
<td>.398 Bottles</td>
</tr>
<tr>
<td>0.31 Glass</td>
<td>18.6 Metal</td>
</tr>
<tr>
<td>1.02 Metal</td>
<td></td>
</tr>
<tr>
<td>7.43 Tile, stone, earthenware</td>
<td></td>
</tr>
<tr>
<td>30.21 10 mm or less, unseparated pieces</td>
<td>6.0 Bone, broken glass, feathers</td>
</tr>
</tbody>
</table>

Source: URENCO [1991] and survey data.
Table 3.7 Estimate of the value of recovered materials

<table>
<thead>
<tr>
<th>Population</th>
<th>Average daily income per person (dong)</th>
<th>Exchange rate (August 1992)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,000</td>
<td>5,314</td>
<td>10,800</td>
<td>$88,567</td>
</tr>
<tr>
<td>4,000</td>
<td>5,314</td>
<td>10,800</td>
<td>120,057</td>
</tr>
<tr>
<td>3,000</td>
<td>5,314</td>
<td>10,800</td>
<td>269,390</td>
</tr>
<tr>
<td>2,000</td>
<td>5,314</td>
<td>10,800</td>
<td>89,797</td>
</tr>
<tr>
<td>All temporary migrants</td>
<td>5,314</td>
<td>10,800</td>
<td>568,713</td>
</tr>
<tr>
<td>Potential savings</td>
<td></td>
<td></td>
<td>341,228</td>
</tr>
<tr>
<td>Nam Ha natives only</td>
<td></td>
<td></td>
<td>145,635</td>
</tr>
</tbody>
</table>

Source: Survey data.

be as high as $192,639 per year, with up to $145,635 of this amount going to households in a single province, Nam Ha.44

SUMMARY

At a functional level, the recovery and refuse systems are articulated through shared sources and access points. At a more personal level, both a sense of shared fate and territorially based affiliation result in particularistic relations between scavengers and refuse workers. The effect of articulation between these systems is an overall reduction in the amount of materials requiring disposal, a presorting of the waste stream prior to composting, and an opening of income-earning opportunities for those who would otherwise be hard-pressed to find comparable work.

A large segment of this population is composed of women and children. Women appear in specific collection occupations, such as itinerant miscellaneous junk buyers, and control a majority of purchasing, especially as depot operators and receivers. Children, on the other hand, tend to fill the scavenging labor force, especially during the summer months when they are released from agricultural work and school. These labor divisions parallel labor divisions within
the rural agricultural communities, which supply at least one-half of the summer scavenging and junk buying labor force.

**ROLE OF COMMUNAL FACTORS IN THE RECOVERY INDUSTRY**

The role of communal factors in organizing and regulating the recovery industry has been alluded to in the previous section. Relations between scavengers and refuse workers have been noted, particularly as they relate to territorial ties within the community of refuse and recovery workers living or working in O Cho Dua ward. This section will draw on survey data to describe the origins of these factors and illustrate how they operate.

Roughly one-half of those employed in Hanoi's recovery industry are natives of a handful of villages in Xuan Thuy district, Nam Ha province. Residents from this district have a long-standing historical connection to refuse and recovery work through specialization in these trades dating back to the French colonial period.

Although a large core of the Xuan Thuy community permanently resides in Hanoi, most scavengers and junk buyers from Xuan Thuy are temporary migrants who work in the recovery industry to supplement agricultural incomes. Most of these temporary migrants live in boardinghouses (nha tro) in O Cho Dua ward. Boardinghouses serve as labor magnets, staging areas from which groups of fellow villagers pass on information and through which they gain access to markets and the community support network. Many of the boardinghouses are operated by retired URENCO employees.

Considering the presence of such a large rural labor force, many of the features of rural social structure appear in the relations of production within the recovery industry. While these features cannot be used to call the waste recovery industry "noncapitalist," they emphasize the importance of communal factors in organizing and regulating the industry.
HISTORICAL CONTEXT

Village Solidarity as a Characteristic Feature of Vietnamese Social Life
The association of individuals through place of birth or territorial affiliation is an important organizing feature of Vietnamese social life, the roots of which lie in traditional village life. The Vietnamese commonly make light of the statement that people of the same village share a common wealth (đồng hương, đồng tiền). As a moral precept, the vision of shared destiny embodied in this statement carries with it the prescriptive force of mutual assistance. Advantages gained by community members are rapidly spread to others.

Origin of Communal Links in the Recovery Industry
The single, largest source of labor in the recovery industry is a group of villages in Xuan Thuy district, Nam Ha province, to kilometers (72 to 78 miles) southeast of Hanoi [Figure 3.8]. The connection between the recovery industry and natives of this district dates back to the 1930s when Mr. Nam Diem, a native of Xuan Thuy, became director of the Hanoi Sanitation Company (Cong Ty Ve Sinh). Mr. Diem's patronage led to rapid recruitment of village-mates. Since this was a time of economic depression, famine, and political unrest throughout the north, these secure positions must have been perceived as a great boon to the Xuan Thuy villagers. In any event, the patronage of Nam Diem has become part of the oral history of the Xuan Thuy community living in Hanoi. Retired employees and their children still refer to the prerevolution Sanitation Company as the "Nam Diem" company.

Many employees of the "Nam Diem" company settled in the area around Thanh Cong, Giang Vo, and Hoang Cau. Trai Nhan lane, in Hoang Cau village, eventually became the company's collective housing area (khu tập thể). Over time, the village also became home for Transport Unit No. 2 and Environment Enterprise No. 4. Many Xuan Thuy natives have
been and continue to be employed at these Sanitation Company units, as well as at the Nightsoil Collection Unit in nearby Thanh Cong.

Through their connections with refuse handling, Xuan Thuy natives branched out to waste recovery. Initially, children of "Nam Diem" company employees scavenged at the dump in Thanh Cong while older members of the community operated depots. In time, they established themselves as junk buyers and depot operators within the city as well. By the early 1960s, however, the Xuan Thuy waste-recovery community began to coalesce around their residences in Hoang Cau village.

Figure 3.8
The Red River Delta and Xuan Thuy district in relation to Hanoi
Hoang Cau village, Hao Nam village, and O Cho Dua (literally, “coconut market”) were joined to form O Cho Dua ward in 1981. The ward covers about 2 square kilometers and has a resident population of 14,000. The area was formerly used for rice cultivation. As it began to lose its rural character, however, residents turned to fish and vegetable farming. This agricultural tradition is maintained within the ward by two cooperatives. The larger cooperative operates two fish ponds. Water is used from the sewage canal, which runs through the ward, to raise nutrient levels in these ponds. One of these ponds is also used to clean bone. Water from Hoang Cau lake, which abuts many recovered materials shops, is used to wash recovered materials as well. Ponds are drained and debris removed annually.

Many small factories that use recovered materials are also located in the ward. Many are district cooperatives or former district cooperatives. During the planned economy period, these cooperatives were not granted adequate input quotas from the central government. As a result, they were forced to turn to the recovery industry. Throughout the planned period, the recovery industry operated as a clandestine private-sector enclave. The symbiosis that developed between private waste recoverers and district cooperatives, supported by the local political administration, allowed for the physical integration of buyers and sellers within the ward. Current manufacturers operating in the ward include those of plastics, steel, glass, fabric, and wire cooperatives and private work groups.

Within the ward, fifty-eight households trade in scrap metals, four buy and sell nị ọgụ (LDPE plastic), five buy and sell miscellaneous waste materials, and one buys and sells bone.

**CURRENT CONTEXT**

**O Cho Dua and the Nam Ha–Xuan Thuy Recovery Community**

The foregoing pattern of communal networks is also evident in the distribution of Hanoi’s scavenging and junk-buying population by native province. At 48.7 percent of the total,
natives of Nam Ha province comprise the single, largest segment of the scavenging and junk-buying labor force (Table C.11; Figure 3.9). They are followed by natives of Thanh Tri province (14.1 percent). Trieu Khuc village, a major suburban recovered materials trading center, is located in Thanh Tri. Natives of Trieu Khuc comprised 7.6 percent of the sample. The third largest group of scavengers and junk buyers working in the city are natives and permanent residents of central Hanoi (10.3 percent). Unlike those from Nam Ha or Trieu Khuc, Hanoi natives tend to be more heterogeneous and less supported by communal networks.

Considering the size of the Nam Ha-Xuan Thuy labor force, much of the remaining section will be devoted to describing the recovery community they have organized. Some comments, however, are reserved here for waste recoverers outside this community.

Trieu Khuc village, in Thanh Tri district near the suburb of Ha Dong, is the most important waste-recovery center outside O Cho Dua (Figure 3.2). It is situated in what historically has been the Red River Delta’s most diversified...
industrial area, a location that has provided both a source and an outlet for recovered materials. The community of waste recyclers centered in Trieu Khuc has been involved in the industry for at least sixty years (Gourou 1936). Originally, members of the community traded in such materials as human hair and duck feathers. Although duck feathers are still collected by Trieu Khuc villagers and are used locally in manufacturing feather dusters and within the delta in manufacturing yarn, village traders have expanded to include the full range of recovered materials, much of which is collected by satellite depots in urban Hanoi.

The change in economic institutions begun in 1979, which have culminated in a withdrawal of internal travel restrictions (1988) and end of state subsidies (1989), has produced conditions under which demand for recovered materials, employment scarcity, and changing consumption patterns would combine to invigorate both the market for and the supply of recoverable materials and create a labor force willing or compelled to enter into low-status work. As a result, new entrants into the waste industry, at all levels of the hierarchy, have created their own niches in the system only marginally connected to the traditional networks. Among these are the bottle and scrap-metal dealers along Dai Co Viet, and scavengers and junk buyers from suburban and rural communities. Some, like those from Dong Anh, have already established a specialty. Others use traditional trading networks. The most recent entrants, which began to appear in late August 1992, are landless agricultural laborers who work in the recovery industry as a refuge when no other work is available. Unlike members of the traditional recovery communities, these landless laborers have no support network in the city to aid them in finding housing, equipment, training, and protection, or in accessing markets.

**Purpose of Work in the Recovery Industry** Overall, more than one-half (52.4 percent) of the scavengers and junk buyers working in Hanoi used work in the waste-recovery industry
to provide supplemental income during the agricultural off-season (Table c.10). The percentage for natives of outer provinces was higher (65.5 percent), with natives of Nam Ha province claiming work in the recovery industry to supplement agricultural income in the highest percentage (70.8 percent). By contrast, natives and permanent residents of Hanoi were divided among those who entered work in the waste trades as a refuge from destitution (55.5 percent) and those who used it as their main source of income (44.5 percent).

Natives of Nam Ha-Xuan Thuy use work in the recovery industry as a source of cash income needed to pay for goods and services partly and/or formerly provided by agricultural cooperatives. Cash earnings are used to pay taxes, to purchase fertilizer and pesticides, to pay for health care and education of children, to construct or repair homes, and to save for establishing households (sản xuất gia đình). Among the items most frequently mentioned as gifts to family and relatives in the countryside are detergent and lard.

**Length of Stay** The linkage of work in the recovery industry with rural production colors much of the relations of production, reproduction, and consumption in the community of waste materials recoverers. The most obvious of these connections is the leading role played by agricultural cycles in determining when and who is able to work in Hanoi.

Overall, nearly 60 percent of the scavengers and junk buyers working in Hanoi during the peak season were temporary migrants to the city (Table c.9). As might be expected, this ratio was higher among natives from provinces at greater distances from the city. Specifically, 86 percent of both the outer province population in general and the Nam Ha population in particular resided in Hanoi temporarily (Table c.9). By comparison, only one respondent in the suburban sample was a temporary migrant to Hanoi.

For most, migration follows rice-cultivation cycles. Two crops are normally grown in the Red River Delta. The **chièm**
crop is planted in November and transplanted in January. Harvest is in May. The múa crop is sown in late May or early June. Transplanting, which begins in mid-July, is generally complete by early August. The múa crop is harvested between early October and early November.

Accordingly, the window for work in the recovery industry extends from late May to late November, roughly seven months (Table c.12). The median length of stay in Hanoi is three months, with the peak of the waste-recovery season coming between late July and early August.

Figure 3.10 illustrates the arrivals and departures of a small sample of scavengers and junk buyers from Nam Ha. Among this group, arrivals began in May and peaked in July. Departures began in August, peaked in October, and continued with less frequency into December.

This pattern of migration was substantiated through interviews with temporary migrants from Nam Ha working in the recovery industry in Hanoi. These interviews indicated that patterns of temporary migration to Hanoi not only followed planting and harvesting cycles, but mirrored the age and gender divisions of agricultural work as well.

Figure 3.10
Length of stay in Hanoi (scavengers and junk buyers from Nam Ha province)
Men, who typically do most of the heavy work preparing fields for planting, harvesting, or repairing homes, are the first to be released from their duties. Consequently, they spend the most time outside their villages. Some of the men interviewed in O Cho Dua spent up to ten months a year away from their homes and families, returning only during planting and harvesting seasons and at Tết, the Vietnamese New Year.

Women, who do most of the meticulous and routine work transplanting, irrigating, and cultivating, and who also are responsible for the rearing of children and care of the elderly, have more duties on the farm and in the household. As a result, they work in Hanoi over shorter periods, often in conjunction with the supervision of young people.

Young people are also affected by agricultural cycles since their work is equally necessary during peak planting and harvesting times. However, like men, they are likely to be released from agricultural labor earlier than women. Nevertheless, because younger children, and in the culture of the community, especially young girls, require supervision, they follow the migration patterns of women.

**Labor Force Characteristics**  These assumptions regarding migration patterns are corroborated in gender data on the population of scavengers and junk buyers from Nam Ha province working in Hanoi. Nearly one-half of the sample collected in August 1992 was under the age of twenty (Figure 3.11). The mode for girls was fifteen years old, and for boys the mode was sixteen. None of the respondents were under ten years old. The majority of the remainder of the sample was comprised of women—the single, largest age group being between thirty and thirty-nine years old.

Considering the point in the agricultural cycle at which the survey was conducted, one would expect a high percentage of children who were not attending school and whose labor is primarily required in planting and harvesting. Women should also be highly represented since many would be released from the routine work of cultivating and irrigating.
One would also expect adult males with comparable frequency since males would also be released from the requirements of heavy work.

The paucity of adult males in the sample of scavengers and junk buyers requires an explanation that begins with the question of age and gender divisions within waste-recovery occupations (Figure 3.12). In this division, scavenging is predominantly an activity undertaken by children. Nearly 65 percent of the scavengers in the sample were between the ages of ten and nineteen. From this peak, the proportion of scavengers within age groups declines steadily and dramatically. Junk buyers, however, reach their peak in the thirty to thirty-nine age group. Nearly 80 percent of the Nam Ha junk buyers in this age group were women, as were Nam Ha junk buyers in general.

The picture that emerges from these statistics and from interviews is one in which women and children migrate to the city to work as they are released from agricultural labor (Figure 3.13). A majority come in family or kinship groups, with an older woman supervising younger children. Most often, this older woman is a sister, aunt, or mother.

Women take on the more demanding tasks of junk buying, which requires both skill and enterprise in keeping aware of market prices and in bargaining with sellers and
buyers. A majority purchase miscellaneous materials from households and small shops rather than work as specialists. Miscellaneous materials buying is the easiest form of junk buying to enter, and since it is an itinerant trade, it allows women to supervise younger people working as scavengers in the same area.

Children take on less demanding jobs as scavengers, the waste-recovery occupation that requires the least amount of trading and handling of cash. Scavengers need only bargain with depot operators and receivers. In addition, since many work within family units, older household members are able to bargain while the children gain experience.

**Figure 3.12**
Age distribution of Nam Ha scavengers and junk buyers (by occupation)

<table>
<thead>
<tr>
<th>Age group</th>
<th>No. of respondents</th>
</tr>
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<tbody>
<tr>
<td>10-19</td>
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<tr>
<td>20-29</td>
<td></td>
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<tr>
<td>30-39</td>
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<tr>
<td>40-49</td>
<td></td>
</tr>
<tr>
<td>50-69</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3.13**
Age, gender, and occupational distribution (scavengers and junk buyers from Nam Ha only)

<table>
<thead>
<tr>
<th>Age group</th>
<th>Male scavengers</th>
<th>Female scavengers</th>
<th>Junkmen</th>
<th>Junkwomen</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-19</td>
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The question of adult males, as yet unanswered, requires some conjecture built on observations and interviews, rather than statistical data for its resolution. During interviews of boardinghouse residents, receivers, and depot operators, it became obvious that the recovery industry branches out beyond the hierarchy of collection, purchase, and trade to include wage and salaried workers. Adult males, although generally a minority within the recovery industry, not only work as junk buyers and scavengers, but also as porters and laborers. They load scrap iron, bottles, and bones, dismantle vehicles, work as security guards, and handle day-to-day inventory management functions. Their main base of operation is within O Cho Dua.

**Place of Residence** O Cho Dua is also the single, largest residential base for the waste-recovery industry within the city (Table c.13). Nearly 55 percent of the scavengers and junk buyers sampled in the survey lived within the ward (Figure 3.14). If the total number of those employed in the recovery industry—including wage and salaried workers, depot operators, receivers, and dealers—was considered, this proportion would be even greater.

Other residential bases within Hanoi occur in Van Chuong (9.2 percent) and Lo Duc (6.5 percent). Thanh Tri district, where Trieu Khuc village is located, is the major suburban base (13.8 percent).

**Housing** Boardinghouses (nhà trọ), necessitated by the large number of temporary migrants employed as scavengers and junk buyers in the city, are an extremely important feature of the recovery industry, especially for the Nam Ha–Xuan Thuy community. Out of a sample of forty-eight temporary migrants working as scavengers and junk buyers in Hanoi, forty-four (92 percent) resided in boardinghouses, the majority (65 percent) in O Cho Dua ward. Among natives of Nam Ha, this figure was even higher, approaching 82 percent (Table c.14).

The latter point underscores the particular importance of boardinghouses to the Nam Ha–Xuan Thuy recovery com-
Boardinghouses link urban and rural segments of the community. They provide a gathering point for villagers, and a source of shelter, information, access to markets, and security. Most are operated by permanent migrants from Nam Ha, many of whom are current or retired URENCO.

Figure 3.14 Location of residence (scavengers and junk buyers working within Hanoi’s four urban districts)
employees and their children, who provide shelter in a spirit of enterprise and shared destiny. Some are operated by receivers who keep space available for their clients in exchange for the rights-of-first-refusal over materials collected. One boardinghouse, in which temporary migrants are allowed to stay rent-free, has been constructed for the community by its wealthiest member.

Nearly all boardinghouses in the community are segregated by village of origin, a situation that provides an extension of village relationships to the urban context. Friends and relatives, gathered in the same location, share some domestic chores with companions and supervise the activities of children. Boardinghouses also provide a point for the transfer of news and information between the rural and urban components of the community.

O Cho Dua, as the residential center of the Nam Ha-Xuan Thuy community, is clearly evident in the relationship between place of origin and place of residence (Table c.13; Figure 3.15). Out of fifty-seven scavengers and junk buyers from Nam Ha province for whom residential data were available, forty-nine (86 percent) lived in O Cho Dua.

By all indications, this Nam Ha-Xuan Thuy labor force, centered in O Cho Dua ward, is growing. According to a 1988 census of the ward, thirty female residents were involved in recovering materials in the city (HPC 1988). By 1991, the average number of scavengers and junk buyers operating out of the community had grown to 600. In August 1992, at the height of the recovery season, almost 2,500 scavengers and junk buyers were living in the ward.

**Market Relations** In many ways, the growth of the Nam Ha-Xuan Thuy recovery community over recent years is part of a retreat into traditional village specializations and relations of production that have been occurring throughout the Red River Delta during the current period of economic and social transition. These village specializations and traditional production or trading patterns have reasserted themselves as socio-economic institutions, bridging gaps created by the with-
drawal of the state from economic life. As this relates particularly to the recovery industry, communally supported specializations established during the colonial period and deepened during the planned economy period have provided the basis for an integration of rural-migrant and urban-settled affiliated groups.

The communal factors governing the relations of exchange within the Nam Ha-Xuan Thuy recovery community provide, on the one hand, a guarantee of access to income-earning employment and, on the other hand, a means of mediating the transfer of surplus. The openness this system provides allows rural members of the community access to income-earning work in the recovery industry as they are freed from work in their main occupation, agriculture. In addition, housing is arranged within the community of friends and relatives, as is most equipment, training, and introduction to dealers, receivers, and depot operators.

Figure 3.15
Relationships between place of origin and place of residence

Hanoi suburbs in italics
Receivers and dealers, many of whom are the children of preindependence migrants from Nam Ha, appeal to communal solidarity to maintain the loyalty of their suppliers. They reinforce these bonds by a variety of means that resemble typical forms of social relations linking patrons and clients in village social systems. Some send gifts and provide other social services to home villages during the New Year season. Others provide banking. One community dealer has constructed housing for scavengers from her native district and is involved in restoring historic pagodas within Hanoi. As another indication of her social standing, she conducts poetry readings in the courtyard of her home in O Cho Dua.

The status accorded receivers and dealers within the Nam Ha-Xuan Thuy community does not imply that antagonism or suspicion of motives does not exist. Collectors (scavengers and junk buyers) are protective of their relative independence, an independence based on the freedom to sell where they choose. Receivers, on the other hand, complain of lack of loyalty. Furthermore, while the urban and rural communities are tied by communal bonds, they are separated by forty to sixty years of independent development enforced by restrictions on internal travel. This break in history has produced two separate communities: the urban community with a long-standing position in the refuse and recovery systems, and the rural community, whose need for cash income to supplement agricultural earnings coincides with the urban community's need for a labor force willing to undertake the low-status work of collecting recoverable materials.

The refuse disposal and waste-recovery systems operating in Hanoi are articulated through common sources, access points, and relations between personnel. This articulation affords scavengers and junk buyers within the recovery system access to materials while reducing the total volume of materials requiring disposal. Personal relations between the two systems are mediated by both common interests, as when
unrelated members of each community engage in mutual assistance, and communal obligations. This latter factor is most evident in relations within the Nam Ha–Xuan Thuy community. In recent years, this village connection has been the basis for growth in circular migration by members of the community residing in the home province. In this pattern of migration, natives of Nam Ha–Xuan Thuy, who migrate to Hanoi during the agricultural off-season to work in the recovery industry, are housed in the community’s urban base, O Cho Dua. This exchange provides the urban contingent of the community with a labor force willing to do low-status and, possibly, hazardous work. It provides the rural community with a reliable source of income and temporary housing.
Waste Recovery as a Peasant Industry

This chapter provides an analysis of Hanoi's waste-recovery system, based on observations of recovery systems in other cities, a reiteration of salient points from the case studies presented in Chapter 3, and application of the framework of society and economy developed in Chapter 2. The title of this chapter emphasizes the most striking characteristic of Hanoi's recovery system: the presence of a high proportion of temporary rural migrants who collect and sell recoverable materials to supplement their agricultural incomes.

It will be argued that the presence of these temporary rural migrants can best be understood through reference to a traditional Vietnamese form of industrial organization, based on specialized but interdependent communal networks, which Gourou (1936) termed "peasant industries." It will further be argued that the re-emergence of this traditional form of industrial organization, submerged within the cooperative system during the planned economy period, has been conditioned by the ongoing restructuring of socioeconomic institutions taking place in Vietnam. Through withdrawal of the state from large areas of social and economic life, this restructuring has created a labor force willing or compelled to do low-status and low-paying work, and created a supply of and demand for materials recovered from the waste stream.

Finally, it will be contended that the value of interpreting the recovery industry in this light is explanatory and predictive. While the recovery industry, as a peasant industry, has certain advantages vis-à-vis capitalist or petty capitalist firms due to its particular combination of productive, consumptive, and reproductive factors, these same advantages can be turned to stagnation of productive forces and exten-
sion of exploitative relationships if networks of reciprocity erode under market pressure and unsupportive state intervention.

In previous chapters, the general characteristics of recovery systems were discussed, a model for analyzing such systems was developed, and the specific systems in place in Hanoi were described. The major points of these arguments are restated below.

**CIRCULAR MIGRATION, AGRICULTURAL CYCLES, AND COMMUNAL AFFILIATION**

Survey and interview data regarding the recovery industry in place in Hanoi confirmed several points derived from a reading of the literature on scavenging. Specifically, investigations in Hanoi suggested an important role for communal factors in organizing and regulating the recovery industry. Although not as entrenched as the literature suggests, three obvious examples of the means by which these factors operate in Hanoi are evident in various forms of hierarchy, dependency, and labor-market segmentation. Hierarchy and dependency ensure access to livelihood resources and mediate the transfer of surpluses. Segmentation serves to reserve access to work among those whom the tested loyalties of a common social group provide a guarantee of eventual restitution.

Except for Cairo, none of the other cities investigated had as strong a territorial link to segmentation of work in the recovery industry, especially in terms of the vital function such work plays in maintaining rural agricultural households, as the recovery industry in Hanoi. More than one-half (59 percent) of the peak-season labor force within Hanoi's recovery industry are temporary residents of the city whose migration patterns follow agricultural cycles. More than one-half (52 percent) work in the recovery industry to supple-
Waste Recovery as a Peasant Industry

merit agricultural income. Nearly one-half of the labor force (49 percent) are natives of a single province (Nam Ha). Most come from a handful of villages in a single district within that province (Xuan Thuy). Nearly all (86 percent) the natives of Nam Ha province working as scavengers and junk buyers in the city, along with about one-fifth (21 percent) of those from other provinces, reside in O Cho Dua.

Materials collected by residents of O Cho Dua are exported, shipped to manufacturers in other areas of the country, and used by plastics, metal, glass, and wire manufacturers within the ward. Direct links between manufacturers and suppliers of recovered materials within the ward were established during the planned economy period, when district enterprises found it difficult to get state input quotas. Over time, the combination of access to material sources (through communal ties with the refuse company), labor supply (through members of the Nam Ha-Xuan Thuy community), and demand (through local manufacturers) created an integrated system that effectively recovered much of the city's waste materials, reduced the amount of materials requiring disposal, supplied materials to local manufacturers, and provided employment to many people.

SOCIETY, THE STATE, AND MARKET REGULATION

The degree of labor-market segmentation and articulation between public and private networks these relationships suggest goes against economic models that ignore social factors in the organization and regulation of labor and industry. It directly and forcefully contradicts notions of the informal sector, especially in its conceptualization as an autonomous, open, and small-scale labor compartment. It further undermines conceptions of informality as a labor process outside regulatory institutions, including, but not limited to, the state. Furthermore, by suggesting both horizontal and vertical forms of reciprocity, social relations within the recovery system intimate a level in the relations of exchange typi-
cally uninvestigated by neo-Marxist researchers. These relations go beyond the more familiar territory of class struggle and articulated modes of production to reveal a social context to work.

The sociological view of economic life, which thus emerges, begins with two sets of assumptions. First, it assumes that there are only three forms of exchange: reciprocal, redistributive, and market. Reciprocal forms of exchange have their basis in an anticipation of eventual restitution within an established social network. Redistributive forms of exchange have their basis in centralized collection and reallocation. Market forms of exchange have their basis in atomized and unrepeatable acts between anonymous buyers and sellers. Of the three, only market forms of exchange, actualized as market-competitive behavior, are assumed to exist, in an idealized form, independent of socio-organizational constraints. Reciprocity and redistribution, on the other hand, determine both patterns of social relations of exchange and patterns of social organization.

This latter point leads to the second set of assumptions developed in this thesis, that is, that there are only two types of socio-organizational factors: associative and communal. Associative factors, which are based on a rational adjustment of interests between groups, are largely redistributitional. Communal factors, based on an anticipation of restitution within established networks, are largely reciprocal.

Using these two sets of assumptions, built on both theoretical and empirical bases, a strong contention has been made within this thesis that the idea of society organized around a self-regulating market is a chimera. Rather, it has been asserted that markets are embedded in society through socio-organizational constraints that affect the range of options under which individuals can actualize exchanges.56

Socio-organizational constraints are not static, however. Rather, in the process of capitalist urbanization and industrialization, the increasing density of social relations brought about by increasing divisions of labor are paralleled by an
increase in market regulation through associative/redistributive means and a relative decline in communal/reciprocal means. The state plays a key role in negotiating these regulatory shifts (primarily in the aid of capital) evident in such diverse forms as land-use controls and labor laws. This does not imply, however, that the regulation of market-competitive behavior through communal/reciprocal means either ceases to exist or is completely subjugated to associative/redistributional factors. In fact, a major point of this thesis has been that, during crisis, trusted communal loyalties based on family, kinship, territory, ethnicity, or religion re-emerge as instrumental factors in the distribution of scarce livelihood resources.

CONTINUITY AND CHANGE

The generalized picture of society and economy developed in this thesis has been purposely presented as a framework for analysis rather than a programmatic model. The principal reason behind this choice has been a decision to allow the richness of local context to determine when and in what manner the factors involved exhibit themselves rather than impose a universalized development agenda. This call for historicity assumes that continuity and change have their origins in precedent.

In northern Vietnam, the primary sociocultural precedent investigated in this research has been the role of communal factors, especially the household and the village, in organizing and regulating social and economic life. As will be discussed, the re-emergence of these factors, partially submerged during the planned economy period, has been due to the specific circumstances of a society transiting from central allocation of productive resources to allocation through markets. These changes, paralleled by a withdrawal of the state from large areas of economic and social life, have necessitated a retreat into traditional forms of market organization and regulation.
PEASANT INDUSTRY IN NORTHERN VIETNAM

In his study of peasant life in northern Vietnam nearly sixty years ago, Gourou (1936, 1955) described a largely rural, labor-intensive, and small-scale industrial system in which the exclusivism of the village was profoundly evident. He termed this industrial system, ideally suited to the needs of a rural, agricultural population, “peasant industry” in recognition that “all the craftsmen are first and foremost peasants, who would give themselves entirely up to agriculture if the extent of their land were great enough” (Gourou 1955, 487).

The characteristics of peasant industries identified by Gourou (1936) are listed below.

1. Labor force comprised of peasant farmers who would rather give themselves entirely to agriculture if they could
2. Village-based industries expressed in both settled and itinerant forms
3. Household as primary unit of production
4. Specialization and interdependence
5. Simple technology, elaborate techniques
6. Rich in labor, poor in resources
7. Dismal, but valuable, earnings

Despite nearly sixty years of social change and experimentation in northern Vietnam, these seven features have remained the principal characteristics of peasant industries, evident in villages throughout the north to this day.

GOUROU'S DESCRIPTION OF NORTHERN VIETNAMESE PEASANT INDUSTRIES

Form

Gourou described two forms of peasant industry within the Red River Delta. The form that he most carefully investigated, settled peasant industry, was organized within villages but produced articles sold outside the villages. The second form, which received less careful treatment in Gourou's narrative, was carried out by artisans and traders working outside their village who returned more or less frequently to
their homes. Although some industries belonged entirely to one or the other of these categories, others operated in both. Weavers and potters, for example, fell entirely within the category of settled village industries. Carpenters, tailors, brick makers, and jewelers, on the other hand, generally worked as itinerant trades people. Basket weavers and soya curd (dậu phư) makers could be found working under both conditions, depending on the season.57

Regardless of the form, in the typical pattern of peasant industry, production of single articles and use of material inputs were divided among a network of households and villages. Where a single article was the object of production, households in each village in the network performed only part of the manufacturing process and sold their output to households in other villages that would either perform another operation or complete manufacture of the article. This division of manufacture was particularly striking in the silk industry. Although villages that generally raised mulberry trees also raised silkworms, many villages in the delta only raised mulberry and sold leaves to villages that only raised silkworms. These villages, in turn, sold cocoons to silk-reeling villages that generally did not raise silkworms. Finally, the silk-reeling villages would sell their output, silk thread, to weaving villages that did not spin (Gourou 1955, 582).

A pattern similar to the division of manufacture was found in the use of materials. Households within villages generally used only a part of the raw material needed for their particular purposes and sold the unused part to households in other villages that needed it for manufacturing articles of a different category. Gourou illustrated this point by describing the manufacture of lantania leaf hats and coats. Households in villages within Ha Dong province that manufactured raincoats from lantania leaves, having obtained these leaves from villages outside the province, used only the tips and resold the remaining portion to households in different villages within the province that made hats (Gourou 1955, 583–84).

This pattern of manufacture encouraged independence. Many industrial villages required that other villages have a
normal activity if they wished (1) to find an outlet for or source of unfinished goods, (2) to buy unused outputs indispensable to their own manufacture, or (3) to rid themselves of unused outputs, the sale of which often contributed to the better part of their profits. Often, this interdependence resulted in long-term relationships between buyers and sellers within the manufacturing process. For example, the villages of Giap Nhi and Giap Tu (Thanh Tri district), which made large quantities of high-quality silver and gold-colored votive ingots, relied on the neighboring village of Giap Bat for the starch needed to prepare glue used in their manufacture (Gourou 1955, 584). Similarly, potters in Bat Trang (Gia Lam district) purchased the ash required to produce enamel glaze from potters in Dong Xa (Ha Nam province) who produced only unglazed pottery. Through both forward and backward linkages, the multiplication of these dyadic relationships resulted in a complex and delicately adjusted system. The unfortunate consequence of this system, however, was its vulnerability to breaks in the network. If a certain village within the network ceased to manufacture its traditional product, other villages within the network would be placed at risk of collapse.

Factors Contributing to the Division of Labor in Peasant Industries

Gourou recognized the poverty of artisans, the relation of their industrial work to agriculture, and the exclusivism of the village as the three most important factors contributing to the division of labor and manufacture in peasant industries.

Poverty  Poverty made it impossible for peasant artisans to carry out the manufacture of an article to its completion. With no reserve funds on which to draw, artisans were compelled to resell raw materials after a slight transformation in order to make the minuscule profits through which they met their daily needs (Gourou 1955, 587). As a result, they could neither stockpile raw materials, taking advantage of seasonal or volume-price differentials, nor keep their stock of unfin-
ished products for further processing, and thereby take advantage of higher value added.

This latter condition was exacerbated by the need to repay loans with which they initially purchased materials. For most, advances in cash or in kind were made with the guarantee of repayment in the artisan's output. Where cash was extended, artisans, anticipating a certain level of profit, often extracted their potential earnings from the sum before purchasing materials. Silkworm growers were thus able to live on advances made by cocoon buyers and spinners, though they were obliged to sell cocoons immediately upon their formation in order to repay these advances.

Through this need to turnover output as rapidly as possible, which precluded carrying out manufacture to its highest value product, the majority of those employed in peasant industries received only dismal earnings. Given a four- to five-month work period, Gourou estimated that artisans in the more common trades, such as rice polishers and basket weavers, made a yearly income of from 4 to 5 piasters, whereas more favored tradespeople, like masons and carpenters, could earn from 25 to 30 piasters (Gourou 1955, 593).

**Relationship to Agriculture** Those employed in peasant industries were able to accept such low wages due to the relationship between their industrial work and their main endeavor, agriculture. The peasants of the Red River Delta most often looked to industry for supplementary income with agriculture providing a base for subsistence. There were two interrelated reasons for this. First, due to the extremely high physiological density and small household plot sizes within large areas of the Red River Delta, particularly the maritime provinces, such subsidiary activities were needed simply to survive. Second, village-based and itinerant industrial work provided peasants with a small source of cash income that, in addition to its use in meeting occasional expenses, particularly the payment of taxes (Gourou 1955, 593), provided a means of reserving a larger quantity of rice for household consumption.
Exclusivism of the Village  Gourou saw the root of specialization in peasant industries in the solidarity of village life (Gourou 1955, 598). This solidarity resulted in the rapid spread of advantages gained by members of the community, including elevation of a villager to an administrative position, external training, or local innovation within the village, and protection of such advantages from outsiders. Thus, the location of industries in particular villages has been largely the result of chance, rather than through geographic or economic factors. In Gourou's own words,

It was chance that brought it about that an ingenious man set up the manufacture of a new article in a village which was usually his native village. He had learned outside, or had invented the techniques of this industry, and he had seen the happy sales of this product. With the success of this artisan, the other villagers set to work imitating him, and thus a village specialty was begun. The village then developed a solidarity in keeping the secret of its manufacturing procedures and know-how to prevent the spread of the new industry and the birth of other industrial villages. (Gourou 1955, 575-76)

The degree to which this protection of advantages was carried out varied among villages. Rambo (1973) suggests that one important variable in this distribution was the competition fostered by high population densities. This competition not only forced peasant households to seek income outside their farming activities but also supported the development of protected economic niches. Due to the slim margins on which households survived, these niches were jealously guarded. At times the degree of protection reached phenomenal proportions. Extreme cases recorded by Gourou involved certain industrial villages where women were forbidden to continue the practice of the industry of their native village if they married an outsider. In a few even more extreme instances, village trades were only taught to young men and married women (Gourou 1955, 595-96).

Social Relations
Social relations within peasant industries existed in three contexts. The broadest context was the village. Peasant in-
dustries were, first and foremost, village-based industries (Gourou 1955, 487, 578). As such, they were subject to the various forms of regulatory control practiced within the closed corporate communities of northern Vietnam. These practices included (1) maintenance of corporate control over intellectual and physical assets; (2) redistribution of surpluses within the community; (3) control over membership; (4) limitations on communication with the outside world; (5) production for subsistence; and (6) use of primitive, labor-intensive technology (Rambo 1973, 28-42).

Alone or in combination, each of the factors affected regulation of peasant industries. Control over community property, limitations on communication with the outside world, and control over membership served to reinforce village monopoly over specific industrial processes; production for subsistence provided a means to escape market pressure if, or when, markets failed; use of primitive technology allowed for maximum use of abundant labor; and redistribution of surpluses partially evened disparities between households.

Within this structure of village life, households served as another, more particularistic, context for social relations. Peasant industries, particularly those settled in villages, were family businesses. They generally did not employ salaried labor, but rather, each workshop, consisting of a single family living under one roof, divided labor among its members. There were "neither bosses nor employees" (Gourou 1955, 578).

Typically, women took on trading functions, purchasing inputs for the household's industrial activities and selling the household's output in periodic markets or directly as inputs to households in other villages. The exception to this generalization were those industries that produced bulky or heavy goods such as pottery or forged iron. In these cases, men did the trading. Except for ironworks, women also provided the labor force for most settled village industries, especially those involved in an extension of domestic duties.

Patron-client relations provided the third context for
social relations within peasant industries. As alluded to earlier, the poverty of artisans often forced them into credit relationships with buyers of their products. The purpose of these relationships, from the buyers’ point of view, was to ensure a stable supply of materials or products at low cost. From the sellers’ point of view, lack of access to the capital needed to purchase inputs made such relationships a necessity.

The case of silkworm growers has already been mentioned. Another example can be found in the rush-basket weavers of Nam Dinh and Thai Binh.

The most poorly paid workman in the Delta seems to us to be the rush-basket maker of the provinces of Nam Dinh and Thai Binh. In this case we have almost certain information since it is calculated by exporters of the baskets. The baskets are bought at two cents of a piaster by the company. The Annamese middleman does not buy it for more than one and one half cents, for the artisan is his debtor and must pay him for the red and green dye indispensable for certain baskets. (Gourou 1955, 588)

Two things are important to remember in these relationships. First, the extension of credit was predicated on payment in the artisan’s output. This allowed the lender, often a household in another village within the trading or manufacturing network, to extract rent through a systematic lowering of purchase prices and ensure a steady supply of products or materials that could then be processed and sold. Second, buyers may themselves be bound by credit obligations to their patrons, a situation that forces them to squeeze their suppliers. In effect, the whole system supported the interests of the largest wholesalers and exporters, who, through the extension of credit relationships to many suppliers, were able to monopolize a significant share of the market. The result of this situation was, in Gourou’s words, “a veritable sweating system” (Gourou 1955, 589).

PEASANT INDUSTRY DURING THE PLANNED ECONOMY PERIOD

Information on peasant industries during the planned economy period is sketchy, though much can be intimated
through a history of state policies. First, the socialist state clearly drew on deep-rooted village sentiments, forms of production, and patterns of social organization in its bid to liberate the nation and provide for its citizens. Before the French occupation, villages in the Red River Delta had complex and effective means of regulating social relations and addressing production problems. These systems, held in place principally through kinship and territorial solidarity (Cuc, Gillogly, and Rambo 1993), remained largely intact, despite the pressure placed on them by the French colonial regime (Gourou 1936, 1955). Nevertheless, conflict between the indigenous socioeconomic system and the capitalist ideology introduced by the French provided a major base of rural discontent. The Marxist-led anti-imperialist movement, which drew on this discontent, succeeded both through the Vietminh’s effective combination of nationalism, equality-oriented social reforms, and the skillful use of this indigenous precapitalist tradition (Luong 1992b). After the revolution, the socialist state built upon these traditional bases as a means of increasing production and advancing toward socialist reconstruction. By so doing, the state preserved forms and relations of production that were eroding during the colonial regime (Scott 1976) and would likely have been deformed through insertion into the capitalist marketplace (Wolf 1969).

The preservation of these traditional forms and relations of production may not have been the intention of the state, whose goal was a transformation of society, but rather resulted from both the resilience of these relationships and marked areas of congruence between the state’s objectives and the subsistence objectives of traditional village society. This melding of interests made it possible for the state to cooperatize many peasant industries, retaining traditional labor forces and production networks, through institution of forced purchases (thu mua) and interlocking input-output networks.

In many ways, these arrangements came to possess the character of traditional relationships between patrons and clients. The state provided for the basic needs of workers
and, in exchange, was allowed to extract a socially acceptable surplus, which it was then able to re-allocate to other uses. Furthermore, since traditional forms of production were not abolished, but rather were overlaid with socialist systems of management, workers were able to call upon traditional, communally based production and trading patterns during crises or to increase subsistence requirements. In this regard, Luong (1992a) provides a rare and poignant example based on fieldwork in a traditional ceramics center near Hanoi.

In response to [declining real incomes and] the subsistence needs of their workers, many state and cooperative enterprises arrived at makeshift solutions, some of which were incompatible with the state's policy of curtailing economic activities outside the state and cooperative sectors. More specifically, in [a ceramics] center near Hanoi, the state enterprise established a contract system in 1969 in order to allow workers and their families to supplement their income during their spare time in the evening and on Sundays. It also assisted its workers' households in designing and constructing their own kilns in order to manufacture items on contract. However, the family enterprises of this handicraft center did not merely function as contractors to the state firm. Many also produced for the open market. Surplus raw materials and "defective" products were reportedly not delivered to the state enterprise. A number of family enterprises were also established not as contractors to the state enterprise but as independent manufacturers, circumventing the state's efforts to prevent the growth of a private or capitalist sector and undermining state monopolies. (Luong 1992a, 32)

The local circumvention of state policies was facilitated by the intricate kinship networks and territorially based communal relationships evident in villages throughout the north. As in the former Soviet Union and the socialist countries of Eastern Europe, the state system of redistribution based on associative socio-organizational factors was unable to subordinate communal networks built on the institution of reciprocity. Rather, the two existed side-by-side and integrated one with the other. Thus, while a formal structure of cooperatives, state enterprises, wages, and purchasing system set
the contours of economic life in Socialist Vietnam, the day-to-day functioning of this system, both within agricultural and industrial production, often relied on the trusted loyalties of kinship and territorial community.

**RE-EMERGENCE OF PEASANT INDUSTRIES IN CONTEMPORARY VIETNAM**

The re-emergence of peasant industries in contemporary Vietnam has been occasioned by a withdrawal of the state from broad areas of social and economic life. During the planned economy period, when traditional peasant industries were incorporated into the cooperative system, the state managed capital outlays, product choices, trade relations, and redistribution of surpluses. Withdrawal of the state from these functions has necessitated a revival of traditional patterns of production and exchange as institutions seek to adjust to new social and economic conditions.

Although these changes have been gradually occurring since the acknowledgment of deficiencies in the planned economy by the Sixth Plenum of the Central Committee in September 1979 (McCarty 1992), the real period of renovation (đổi mới) began with the comprehensive reforms established by the Sixth Party Congress in 1986. These reforms, which culminated in the end of subsidies and price controls in 1989, resulted in massive public sector lay-offs, the demise or attrition of many industrial and agricultural cooperatives, and widespread employment scarcity. They, in turn, also resulted in a growing number of private small-scale retailers, service providers, and industries, increasing levels of personal consumption and consequently a greater need for cash income. Although these combined factors provided an impetus for the re-emergence of traditional peasant industries and itinerant trades in general, they were particularly important for the recovery industry. Specifically, (1) the decline of rural agricultural cooperatives and the lifting of internal travel restrictions created a labor force needing new sources of income to meet expenses formerly provided by
the state; (2) employment scarcity, exacerbated by changes in economic and social institutions both within Vietnam and abroad, created conditions under which people would be willing or compelled to do low-paid, low-status work; and (3) although the demise of many industrial cooperatives eroded established trading networks, the recent growth of private industries, many built on collapsed cooperatives, served as an emerging outlet for recovered materials.

Restructuring of Agricultural Production

The collapse of agricultural cooperatives and changes in farmers’ needs for cash income have influenced a re-emergence of traditional peasant production and trading networks in general, and growth in the recovery industry in particular. This growth has been partially due to the release of farming households from obligations to the state and, in turn, a withdrawal of the state from its former obligations to farming households. The major point of departure occurred in 1988. In November of that year, the Council of Ministers effectively freed agriculture from mandatory collectivization in favor of integrated market-oriented measures intended to support the rapid development of commodity production in rural areas. The old system of work points was abolished; cooperative assets were sold; the number of cadres was reduced; and land was redistributed among households. “At the root of these changes was the idea that the basic economic unit was now to be the farming family, rather than the cooperative” (Fforde 1990, 23). What remained of the cooperative structure were extension services, management of collective infrastructure, and certain administrative functions. The state no longer stipulated production targets and could no longer force farming families to sell to state-trading companies at below market prices. 66

Ideally, these changes were intended to produce greater sensitivity to market demand, higher output, and increased incomes to farming families. While output has increased and farmers are more sensitive to market demand, incomes have
not risen proportionately. One of the prime reasons for this phenomenon is that reforms have not only increased the potential profits of farming households, they have produced increased costs as well. These costs have been generated not only through the removal of state subsidies for agricultural inputs, but also through increased costs for services, such as health care and education, formerly provided by cooperatives. When combined with changes in the tax system that allowed farmers to pay their rice tax in a cash equivalent, these additional costs have significantly raised farmers' need for cash income.

**Employment Scarcity**

Long a feature of postliberation Vietnam, the general insufficiency of stable employment, exacerbated by both internal and external forces, has provided a second impetus to the re-emergence of traditional peasant industries. Internally, layoffs due to the failure of state and district cooperatives have released up to one million industrial employees nationwide (GSO 1992d), while forced retirements have released an additional 70,000 civil servants (GSO 1992b). Externally, political changes in former countries of the Council for Mutual Economic Assistance have forced the return of 180,000 guest workers from Eastern Europe, the former Soviet Union, and the German Democratic Republic (Ruijs 1991), while partial resolution of the Cambodian crisis has resulted in the demobilization of 500,000 members of the armed forces (de Vylder 1990). By 1991, the total number of job seekers had reached 1.7 million (The Economist, May 25, 1991).

Hanoi has not escaped the employment squeeze (see Table 4.1). Between 1988 and 1990, roughly 68,500 industrial jobs were eliminated from state and nonstate enterprises within the municipality. The majority of these losses (39,700 jobs) occurred in the smaller scale, nonstate sector managed by the district government.

Increasing levels of employment scarcity produced by the transition from a centrally planned to market economy
have resulted in an increase in the number of people working in street trades, in general, and the recovery industry, in particular. Pedicab operators, soya curd soup sellers, beggars, and vendors of all kinds have begun to line Hanoi's streets. Their increase has been matched, if not surpassed, by the number of scavengers and junk buyers working in the city. This increase has been noted by URENCO administrators and employees, as well as People’s Committee representatives. According to a census of O Cho Dua ward conducted by the local People’s Committee, only thirty women went out of the community to pick waste in 1988 [HPC 1988]. By 1991, the average number of waste pickers had risen to 600. Interviews with residents of O Cho Dua indicated that, at the height of the waste season in early August 1992, more than 3,000 residents of the ward were involved in the collection and sale of recovered materials.

**Industrial Restructuring**

As the employment data should convey, industries in both the state and nonstate sector have seen hardships during the transition from centrally planned allocation of productive resources to market allocation. In the state sector, excess labor, along with reformation of product lines and management approaches, was eliminated. Many district cooperatives and production groups, however, have simply collapsed. Between 1988 and 1992, district cooperatives and production groups nationwide declined from 2,411 to 1,920 units, a 21 percent decrease [GSO 1992d]. Hardest hit were those with

### Table 4.1 Hanoi's industrial labor force (1,000 persons)

<table>
<thead>
<tr>
<th>Year</th>
<th>State</th>
<th>Nonstate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>151.2</td>
<td>127.5</td>
<td>278.7</td>
</tr>
<tr>
<td>1987</td>
<td>151.8</td>
<td>136.7</td>
<td>288.5</td>
</tr>
<tr>
<td>1988</td>
<td>152.9</td>
<td>139.3</td>
<td>292.2</td>
</tr>
<tr>
<td>1989</td>
<td>139.7</td>
<td>94.7</td>
<td>234.4</td>
</tr>
<tr>
<td>1990</td>
<td>122.4</td>
<td>87.8</td>
<td>210.2</td>
</tr>
</tbody>
</table>

Source: Kim and Thu (1992, 132).
less than 200 employees. These cooperatives and production groups, which formed the largest share of collectively managed industries [78 percent], declined by 22 percent.

Within Hanoi, although several enterprises managed by the Hanoi People's Committee or the central government have merged, none have fully closed since the 1988 reforms [McCarty 1992]. Many enterprises managed by districts, however, have either closed or reduced output. In structuring the planned economy, many of these cooperatives traded inputs and outputs in an interlocking credit system that ensured both supply and demand. As a result, when lead firms failed or changed product lines and processes, smaller firms that depended on them collapsed as well.

At the base of some of these trading networks in Hanoi were private waste recoverers. District cooperatives within Hanoi, having limited access to state financial and material quotas, purchased recovered inputs from dealers in O Cho Dua ward, the urban center of the recovery industry, and Trieu Khuc, its suburban counterpart. These arrangements created an interlocking network not unlike the peasant industries described by Gourou. In O Cho Dua, these networks were localized with both consumers and suppliers of recovered materials operating nearby. The decline of district industrial cooperatives, the demand side of the recovered materials equation, has unhinged these networks. Private household industries and larger individual enterprises have grown, however, and have been able to maintain and, in some cases, increase demand.

From 1988 to 1990, the early years of reform, though small industrial cooperatives decreased from 32,034 to 13,086 units, registered household industries increased from 318,557 to 376,930 units. During the same period, registered enterprises rose from 318 to 770 units. Although most household industries are in rural areas and produce handicrafts or food stuff, many of the larger household units and enterprises are urban-intermediate or consumer-goods producers, including paper, glass, plastic, and wire [see Case 4.1].
Case 4.1 Tien Thanh Production Group

Tien Thanh production group, in O Cho Dua ward, is made up of employees of a failed plastics cooperative. The failed cooperative, which was located nearby, had been in operation for twenty years. Like the former cooperative, the production group manufactures bicycle hand grips and plastic sandals. Its hand grips, which have been given a rating of standard quality by the Vietnamese Science and Technology Committee, are used by domestic bicycle manufacturers, exported to China, and sold to local retailers.

Much of the low-density polyethylene used in the manufacturing process is purchased from recovered materials dealers in the ward. The production group buys 200 kilograms of recovered plastic daily at 2,800 dong ($.26) per kilogram.

On many days, it cannot purchase enough recovered plastic to meet demand. This is especially true during harvesting season, when the city's scavengers return to their native provinces and recovered plastic is in short supply. It also occurs when buyers from Ho Chi Minh City place large orders. In order to overcome these constraints, the production group maintains a warehouse where materials are stockpiled during the peak scavenging season for use during periods of short supply.

Using extruders and presses manufactured from scrap truck and tram parts, the firm produces 20,000 pairs of hand grips or 10,000 pairs of sandals per twenty-day month. Most workers are paid by the piece. On an average day, a production team of four to five workers can manufacture 1,000 pairs of hand grips for which they are paid 25 dong ($.002) per pair. Children of workers, who are hired over the summer to trim hand grips and sandals, are paid 4,000 dong ($.37) per day.

HANOI'S RECOVERY INDUSTRY AS A PEASANT INDUSTRY

Many of the features found in peasant industries described by Gourou are evident in the traditional centers of Hanoi's recovery industry. In O Cho Dua, Tam Hiep, and Trieu Khuc, households are the primary units of production, consumption, and social reproduction. Access to information, techniques, and markets is mediated through communal agencies such as kin and village. Over time, communal exclu-
sivism has served to create village specializations and interdependencies. These specializations exist in a settled and itinerant form. In the Nam Ha–Xuan Thuy community, which is centered in O Cho Dua, the settled community resides in Hanoi while the itinerant community resides in the home district from which they migrate during the agricultural off-season. For those centered in Trieu Khuc, the situation is somewhat reversed. Their settled industry operates in the home village, where it supplies materials to local industries and international exporters, while their itinerant trades people commute to Hanoi daily to purchase materials. In addition, while almost all the scavengers and junk buyers from Nam Ha used work in the recovery industry to supplement their agricultural income, only one-half of those from Trieu Khuc did so. Finally, regardless of their origin, all those involved in the recovery industry generally employ low-level technology and, due to limited access to capital and the institution of tying, turn over their products after limited processing.

The relevance of these observations is twofold. First, the organization of rural farming households, as the basic unit of production within the recovery system, provides a direct subsidy to industry through lowered household reproduction costs while increasing the economic security of these households through diversification of income sources. Second, village solidarity provides a means of securing access to recoverable materials, of mediating the transfer of surplus, and of influencing the local state and restricting the more egregious forms of exploitation.

SUBSIDIES AND SECURITY

Rural peasant households are the primary unit of production, consumption, and reproduction within Hanoi’s traditional waste-recovery community. This mixture of economic and social functions within the household, which encourages self-exploitation of household labor under deteriorating terms of exchange, allows peasant households to compete
with capitalist firms producing similar commodities and provides a de facto subsidy to the consumers of these commodities.

The reason for this can be found in the nature of peasant production. Peasant households generally produce use values alongside the production of commodities for exchange (Heynig 1982; Bernstein 1982). Typically, these activities are conducted within the household and village and may include agricultural and handicraft production. Market failure, in terms of falling prices, is experienced by peasant households as a deterioration in the terms of exchange for the commodities it produces for sale relative to those it needs to purchase. Under these conditions, peasant households either reduce consumption, intensify production, or both. As noted by Chayanov (Harrison 1977), the ability of peasant households to reduce their levels of consumption and continue to produce commodities under deteriorating terms of exchange allows them to effectively compete with capitalist enterprises producing the same commodities. The effect of these actions, however, is a self-imposed exploitation of household labor that frees capital from any additional management or supervisory costs.

A particularly significant feature of Hanoi's traditional waste-recovery community is the role of circular migration in organizing production. Unlike households entirely dependent on agriculture for both consumption and exchange, rural members of Hanoi's traditional recovery community are able to spatially and temporally divide production for consumption and production for exchange in ways that meet their particular household requirements. Specifically, by linking work in the recovery industry to agricultural off-seasons, members of Hanoi's traditional recovery community are able to reserve greater portions of their agricultural output for consumption while earning income through the production of commodities from urban waste. Furthermore, as long as rural agricultural bases are maintained, where market failure is absolute or access to material sources is restricted, retreat into subsistence (and reduced living standards) remains
an option that psychologically frees households from complete reliance on the market and market relations.

**INTERNAL REGULATION**

As in other peasant industries, Hanoi's recovery industry relies heavily on its own internal social system, based on loyalty to family, kin, and village, for regulation. These loyalties affect relations of exchange, influence actions by the local state, and provide access to a variety of resources, including wastes. As for relations of exchange, though prices are highly influenced by market demand, where and to whom materials are sold is a function of relationships within the recovery community. These relationships allow members of the community open access to a reserved niche in the urban economy. For Nam Ha natives, of whom the majority are temporary migrants, that niche has been in scavenging, junk buying, and truck loading. For Trieu Khuc natives, who reside in the suburbs of Hanoi year-round, the growing niche has been in operating sidewalk depots. A majority of their clients are Nam Ha women. Villagers from Vinh Ninh village near Tam Hiep have a reserved niche scavenging and trading at the municipal dump.

The local state is involved in these processes through participation in the community's social life and through its responsibility to promote socioeconomic development. In O Cho Dua ward, it carries out its duties using the same forms of social leverage used within the community itself—criticism of those who ignore their responsibility to fellow community members; rewards for those who do; and oversight of potentially illegal activities it may find to the community's advantage. At its disposal are a variety of tools including negotiated tax abatements and control over local land-use decisions.

Similar relationships extend to the management and personnel of URENCO units stationed in the ward. Because of the historical connection of the refuse and recovery systems located in O Cho Dua ward, family, kinship, and vil-
Large ties, which cross the bureaucratic boundaries of public and private enterprise, form the subtext of a relationship that has allowed for the development of norms that, to a casual observer, may appear odd. The most visible exhibitions of these norms can be found in the day-to-day articulation of waste recovery and refuse disposal. This articulation, apart from its more general characteristics as a sharing of sources and access points, includes the common practice of providing scavengers living in O Cho Dua with transportation from the municipal dump on URENCO vehicles returning to the ward. This practice, which allows members of the traditional recovery community to collect materials at the municipal dump and sell them in the ward, while not crucial to the system at this time, could become a key feature in the system’s evolution and a major source of intercommunity conflict if access to urban sources is limited or if dumpsites become the major source of materials.

**Summary and Conclusions**

In this chapter, traditional peasant industries have been presented as an analytical base for interpreting labor systems, industrial organization, and social relations within Hanoi’s recovery industry. Although these systems and relations have been in place in one form or another for at least sixty years, the impetus behind its current growth has been a withdrawal of the state from broad areas of social and economic life. Unlike other peasant industries, however, the recovery industry is unique in that it has never been cooperatized, but rather has existed as a private-sector enclave articulated with public corporations and cooperative enterprises. Before the 1988 reforms, this system provided materials to local industrial cooperatives and large-scale state industries (such as the steel mills in Thai Nguyen) while effectively reducing the amount of inorganic materials in the waste stream. Since the reforms, the recovery industry has continued to fulfill these functions and, through an expanding labor force, through increased demand from local private enterprises and production groups, and through export, has expanded its ca-
capacity. As a result, during the peak season, approximately one-fourth of Hanoi’s waste materials are recycled through the system.

In addition to this important function in urban solid waste management, the recovery industry plays an important role in supplying the livelihood requirements of a large, rural labor force. Scavengers and junk buyers, temporarily migrating to Hanoi during agricultural off-seasons, use work in the recovery industry to supplement their agricultural incomes and purchase agricultural inputs. They are able to do so because of a long-standing relationship between natives in a few rural communities and the work in refuse and recovery industries. These relationships have created a reserved niche in the urban economy, maintained by members of the community permanently residing in Hanoi, which has allowed their rural counterparts open access to income-earning work in a manner that is able to accommodate their rural work patterns.

Both the urban and rural communities benefit from the system. The urban branch of the recovery community has been able to expand along with increases in the number of people willing to enter work in the waste trades. The system has maintained its internal cohesion and solidarity because most of these new entrants are from the rural base of the recovery community. For its part, the rural branch of the community has benefited from this relationship in that it has provided them with a secure and open income-earning niche in the urban economy, which allows them to continue work in agriculture, the main enterprise.

Whether this system and the relationships it has engendered will maintain its equitability and solidarity under pressures placed upon it by increasing market competition and the bureaucratic hegemonism of Hanoi’s refuse disposal system remains a matter of conjecture. Comparisons of policy interventions and their outcomes within the Asia-Pacific region provide one source of scenario-building evidence. The other lies in internal processes of continuity and change.
CHAPTER 5

Continuity, Change, and Emerging Issues

This chapter attempts to forecast possible futures for Hanoi's waste-recovery industry. It does so by examining interventions in waste-management systems that have been proposed or attempted by municipal agencies in other Asian cities and by analyzing processes of continuity and change within Hanoi's refuse and recovery system. Based on these factors, and drawing on the model of economy and society developed in Chapter 2, this chapter proposes three potential futures.

The first assumes that pressures placed on the local ecosystem through rapid increases in population densities will combine with bureaucratic hegemonism to create a situation in which scavengers and junk buyers have limited access to wastes within the city. As a result, an increasing amount of recoverable materials will arrive at municipal dumpsites and, with this, an increasing amount of waste recovery will take place there. The negative side effects of such an evolutionary path include the development of dumpsite-scavenging communities, rent-seeking and extortion by public officials and private gangs, increased competition, and lower standards of living (Furedy 1990).

The second scenario is similar to the first, though unlike the first it assumes that despite the advance of the state bureaucracy, traditional waste-recovery communities (communal production) will be able to evolve and use their influence to soften the most egregious potentialities. The unfortunate side effect of the noncongruence of these two aspects of waste management will likely be an increase in illegal and unreported activities, gang formation, and exploitation by rent-seeking public officials and community patrons.

The final scenario anticipates a stronger role for the
traditional waste-recovery community in organizing solid waste management. In this scenario, recovery community members working within the refuse system, recovered material dealers and traders, and interested nongovernment organizations would draw on the state's substantial interest in promoting social equity as a means of initiating a process built on local experience and local needs.

OVERVIEW OF INTERVENTIONS ATTEMPTED IN OTHER CITIES

Bartone (1986, 39) suggests that, because scavenging is "so widespread, appears to be relatively efficient, and provides jobs for the otherwise unemployed, municipal authorities should seek to make better use of this practice rather than either try to eliminate or compete with it." He lists six types of interventions, all of which have been or are being attempted. These include formal recognition of scavengers as quasi-public servants (Jakarta), public assistance in improving the living and working conditions of scavengers at municipal dumpsites (Seoul), use of government-operated "buying centers" with established price lists (Manila), employment of scavengers in publicly managed composting plants (Kathmandu), organization of waste-recovery cooperatives (Bandung), and the contracting of traditional recovery communities to collect municipal waste (Cairo).

In the broadest sense, each of these interventions can be conceived of as an action that attempts to either eradicate scavenging, bureaucratically incorporate it into the refuse system, accommodate its presence, or collaborate for mutual benefit.

ERADICATION

The most frequent response of municipal governments to real or perceived problems associated with urban scavenging has been to institute rules and procedures designed to restrict or eradicate it. Such eradication campaigns have often been undertaken alongside efforts to fiscally, technically, or bureaucratically rationalize solid waste management.
In such efforts, scavengers and junk buyers may be perceived as hindrances to systematic collection and processing, public eyesores, impediments to the free flow of traffic, and the subjects of public health concerns. Often, as well, efforts to limit or eradicate scavenging are accompanied by an attempt to close the waste stream and centralize treatment. Whatever the impetus, with the criminalization of scavenging brought about by eradication campaigns, scavengers and junk buyers become the targets of harassment and are subject to arrest and confiscation of assets.

A brief overview of relations between the state and private waste recoverers in Metro Manila provides an example. During the 1970s, the Metro Manila government conducted regular drives against scavengers and junk buyers (Keyes 1982). Eradication was promoted on several grounds, not the least of which was to improve the city’s image. The result of these campaigns was not, however, an improvement in managing urban wastes or a reduction in the number of scavengers and junk buyers operating within the city, but rather, through harassment and confiscation of assets, further immiseration of the affected population and concentration of recovery activities at municipal dumps.

By 1987, when a Presidential Task Force on Solid Waste Management was initiating a comprehensive plan to rationalize solid waste management in Manila, there were 11,400 households living and working at dumpsites in the metropolitan area (Furedy 1990). Smoky Mountain, Manila’s infamous dumpsite and home to 14,000 people, had been singled out by the Task Force for development into a “garbage and pollution free community.” The site will be paved and those employed in the waste trades there, as well as at other sites throughout the city, will be rehabilitated in an attempt to discontinue dependence on waste as a source of livelihood. A consortium of nineteen public and private agencies was organized to oversee this transition, which, among other things, proposed the resettlement of recalcitrants to their home provinces.
INCORPORATION

Most municipal governments and sanitation companies have come to regard scavenging as a persistent urban feature. Reactions to this awareness have varied from an acceptance of the inconveniences imposed on their own efforts to rationalize waste management to attempts to incorporate scavengers into this system.

Where incorporation has been the objective, municipal governments have most often attempted to restrict scavenging to controlled sites such as publicly owned composting or materials recovery facilities. These attempts at incorporation have generally been proposed under the assumption that employees of these facilities would be drawn from the ranks of those currently employed in the waste trade (Furedy 1990). However, since the labor requirements of these facilities are much lower and since there is no guarantee that those employed at these plants would be hired from the ranks of those currently working as scavengers, efforts to restrict scavenging to these sites have generally proven impossible. In addition, due to technical constraints, the quality and composition of inputs, and increased labor and energy costs, anticipated savings to municipal budgets through cost recovery have also generally not materialized (Sicular 1989; Flintoff 1976).

A less frequently attempted option for incorporating waste recoverers into the existing waste management system has been to register scavengers as quasi-public servants. In Jakarta, one city where this has been attempted, registration has been coupled with the extension of small loans to eligible participants. Eligibility has been based on employment in the trade and registration in the municipal census. Considering that many scavengers working in the city are illegal residents, the program has had limited impact (Furedy 1990).

The most comprehensive proposal for incorporating scavenging into municipal waste management, carried out in Manila in the late 1970s, attempted to reorganize the re-
covery system by registering collectors, establishing fixed prices, and managing trade through a network of buying centers linked to a single, publicly owned corporation. The effort failed, and by 1980 all thirty buying centers operated by the corporation had closed, partly because of mismanagement.

**ACCOMMODATION**

Some municipal governments have accepted the presence of scavengers and junk buyers as an inevitable outcome of employment scarcity and demand for recovered materials, and have attempted to accommodate, rather than incorporate, waste recoverers. In the most basic form, this simply involves a decision at the municipal level to allow waste recoverers to work unharassed. While this may seem a minor move, legitimization of the trade frees waste recoverers from the insecurity brought by arbitrary confiscation of goods, arrests, and extortion.

Other municipalities have provided support services in exchange for agreements to limit scavenging to certain sites or times. In Seoul, for example, the municipal government has supplied water, electricity, and housing to scavengers working at the Nanjido landfill since 1987 in exchange for agreements on limiting scavenging to certain times and sections of the site (Gotoh 1989). In Mexico City, scavenging at the Prados de la Montana landfill has been allowed under condition that no scavenging occurs at night, when the operation of bulldozers make scavenging particularly hazardous.

**COLLABORATION**

In rare cases, municipal governments have recognized private waste recoverers not as competitors or hindrances, but as competent solid waste managers in their own right. The most notable of these cases is in Cairo, where the Zabalene, traditional waste collectors, pig farmers, and recyclers, have been awarded contracts to collect and process domestic refuse (Bouverie 1991). Refuse is collected throughout the city, sorted
and processed at Zabalene settlements, and marketed through customary channels. The Zabalene also use the materials they collect to manufacture goods for local use and export.

In other cities, less comprehensive but equally progressive measures have been attempted or proposed. At the Teku composting plant in Kathmandu, Nepal, scavengers have been given access to compost windrows, a platform has been constructed to allow collection of materials as refuse is unloaded from trucks, land has been allocated for housing, and a cooperative has been formed to market materials (Furedy 1990).

In Bandung, Indonesia, in the early 1980s, researchers at the Center for Environmental Studies (PPLH) developed the concept of “garbage industrial estates” (Sicular 1989; Poerbo 1991) as a model for neighborhood solid waste management in Indonesian cities. In the model, scavengers and junk buyers, organized in neighborhood waste-recovery cooperatives, would collect domestic refuse, sort recoverable materials, and compost the organic fraction, leaving only the residue for collection by municipal refuse workers.

SUMMARY

As Birkbeck (1978) noted, though the future of recycling is certain, the future of scavenging is not. What is clear, however, is that state-sponsored campaigns to eradicate scavenging lead only to the further immiseration of those affected and a concentration of waste recovery at municipal landfills, where competition and control of access result in various forms of extortion and exploitation. Equally clear is that comprehensive plans to rationalize recovery, whether through state control of trading or the sale of contracts to private waste recoverers, have equally adverse results since noncontract recoverers will continue to ply their trades, albeit with the stigma of illegality.

Programs that appear to have succeeded are those that have either accommodated the presence of scavengers or those that have worked with existing institutions within the recovery system. Most often, these approaches have accepted
the means by which local recovery industries are organized rather than attempt to replace them with more bureaucratically rational alternatives.

Hanoi’s waste-recovery community has been and is being shaped by a variety of endogenous and exogenous factors. These factors influence processes of continuity and change within traditional recycling communities and, in turn, their autonomy, solidarity, and equability. On the positive side, the continued importance of communal relations within the recovery community has supported a sense of solidarity and produced a system in which rural members of the community could retain their relative autonomy. On the negative side, changes in the recovery system due to increasing market pressure, technical and bureaucratic rationalization of the refuse disposal system, and the presence of new entrants from outside the traditional system threaten to disrupt current arrangements and increase the potential for exploitation through market relations.

CONTINUITY

Several social and technical features of Hanoi’s refuse and recovery systems show every sign of adapting and persisting into the current period of marketization. At the broadest level is the historical relationship among residents of Trieu Khuc village, Vinh Ninh village, natives of Xuan Thuy, and work in the waste-recovery system. At a more technical level, due to both the particular characteristics of Hanoi’s settlement, methods of collection are likely to remain labor intensive for some time into the future.

Communal Partitioning

The most prominent feature of Hanoi’s recovery industry is the role played by communal relations in creating secure niches. This is evident in both the origins and residences of those employed. As for origins, the single, largest source of
labor is a group of villages in Xuan Thuy district, Nam Ha province. About 49 percent of the scavengers and junk buyers working in Hanoi during the late summer of 1992 were natives of this district. As noted in Chapter 3, the connection between the recovery industry and these rural people has existed for at least sixty years. Like other peasant industries, this relationship was engendered through the dispersion of an advantage—in this case the elevation of a native son to a position of authority among members of the communal group.

The concentration of refuse and recovery activities in O Cho Dua ward is a legacy of this relationship. Currently sixty-eight households trade in recovered materials within the ward, with the majority specializing in scrap metals. These households rely heavily on scavengers and junk buyers living in the ward to supply them. In August 1992, roughly 55 percent of the scavengers and junk buyers working in Hanoi lived in the ward. Of these, 65 percent sold there as well.

This concentration of waste-related activities also extends to the refuse system. The ward is the site of a dormitory where many retired URENCO workers reside and is home to Transport Unit No. 2 and Environment Enterprise No. 4. URENCO's Nightsoil Collection Unit, located in Thanh Gong, borders the ward.

Trieu Khuc village, in Thanh Tri district near the city of Ha Dong, is the second largest source of labor in the recovery industry and the most important waste-recovery center outside O Cho Dua. Like the O Cho Dua community, the community of waste recyclers centered in Trieu Khuc has been involved in the industry for at least sixty years (Gourou 1936). Originally, community members traded in such materials as human hair and duck feathers. Although duck feathers are still collected by Trieu Khuc villagers and are used locally in manufacturing feather dusters and within the delta in manufacturing yarn, village traders have expanded to include the full range of recovered materials, much of which is collected at sidewalk depots in urban Hanoi.
Because of considerable social and political support within their territorial bases, stable sources of labor, and strong respect for their traditional roles in urban society, barring forced eviction from their territorial bases, both communities are likely to continue existing in some form and to continue filling their niche in urban society.

**Technology**

Besides these social forces, certain technical aspects of production in the recovery and refuse systems appear to be persistent and enduring. Primary among these are the simple tools used in collection. Specifically, the refuse cart, originally introduced by the French, will likely endure as the primary collection tool in Hanoi’s dense urban areas and urbanized villages. These poorly accessible settlements, surrounded by more readily accessible commercial roadways, will continue to require small, maneuverable collection vehicles, like the current refuse carts, well into the future. In addition, the metal hooks, baskets, and balance scales used by scavengers and junk buyers, and the system of dispersed depots, which provide both working capital and convenient drop-off points, will likely persist for some time into the future, as well. These tools and labor processes are immanently suited to the requirements of the trade for low-cost, simple equipment and quick turnaround of limited working capital.

**CHANGE**

Changes in economic and social life have initiated a process of adaptation within Hanoi’s refuse and recovery systems. Among the most prominent of these features have been the end of state subsidies, the switch from central planning to allocation of resources through markets, and the lifting of restrictions on internal travel. These combined factors have produced increases in the supply of labor within Hanoi’s recovery industry, changes in market relations and, through real and potential increases in urban population density, changes in the methods and means of solid waste management.
Labor Supply
The withdrawal of the state from broad areas of social and economic life has created a need among Vietnam's rural labor force for additional sources of income to supplement and subsidize their agricultural activities. Many have done so by retreating into traditional patterns of trade and industry. For natives of Xuan Thuy district in Nam Ha province, this has meant temporary migration to Hanoi for work in the recovery industry.77

The significance of this increase has been threefold. First, it has increased the Nam Ha community's presence in the recovery industry during a time when the population of scavengers and junk buyers has increased overall. Second, since the majority live and trade in O Cho Dua ward, it has reconfirmed the role of that ward as the center of the industry. Third, the need for temporary housing has resulted in conversion of open space around Hoang Cau lake, in the ward, for use as boardinghouse sites. These boardinghouses, segregated by native villages, have become extensions of the rural community in Hanoi and are the crucial magnets to the ward.

Market Relations
Under central planning, while the recovery industry operated under limited market pressure, most other areas of the economy did not. Prices were relatively stable, and contracts were used to manage the flow of inputs. With the end of central planning, the recovery industry has had to adjust to life within a highly competitive market environment characterized by demand-based pricing, the demise of secure contracts with industrial cooperatives,78 and increased competition from other suppliers, particularly suppliers of virgin materials. Within its traditional centers, this has been done by increasing the industry's role as a spot market for low-cost industrial inputs and decreasing its role as a contracted supplier to state and local cooperatives. The result has been a very demand-sensitive pricing structure that occasionally has forced traders and dealers to sell materials at low marginal
returns and has increased the need for warehouse facilities to carry them through periods of market failure.

**Population Pressure**

Population pressure, combined with an emerging real estate market, has resulted in a rapid increase in urban densities and conversion of formerly reserved agricultural and aquacultural areas within the city. Population densities in urban Hanoi have increased tremendously over the recent years (Table 5.1). Between 1979 and 1989, population densities within Hanoi’s urban core grew from 17,741 to 19,571 persons per square kilometer. Between 1989 and 1990, the first full year after restrictions on internal travel were lifted and state subsidies were abolished, population densities grew from 19,571 to 22,916 persons per square kilometer, though densities up to 100,000 persons per square kilometer are reported to exist in the Old Quarter of the city.79

Increasing urban densities are overburdening the capacity of ecosystems to assimilate wastes while segments of the

| Table 5.1 Population and population density in Hanoi municipality |
|-----------------|-----------------|-----------------|
|                 | 1979            | 1989            | 1990            |
| Population      |                 |                 |                 |
| Total           | 2,456,928       | 3,056,146       | 2,095,000       |
| Urban           | 821,222         | 905,939         | 1,060,800       |
| Rural           | 1,635,706       | 2,150,207       | 1,034,200       |
| Area (km²)      |                 |                 |                 |
| Total           | 2,145.51        | 2,145.51        | 933.70          |
| Urban           | 46.29           | 46.29           | 46.29           |
| Rural           | 2,099.22        | 2,099.22        | 887.41          |
| Density (persons/km²) |         |                 |                 |
| Total           | 1,145           | 1,424           | 2,244           |
| Urban           | 17,741          | 19,571          | 22,916          |
| Rural           | 779             | 1,024           | 1,165           |
| Mean annual growth rate |     |                 |                 |
| Total           | 2.45%           |                 |                 |
| Urban           | 1.10%           |                 |                 |
| Rural           | 3.08%           |                 |                 |

Sources: Central Census Steering Committee [1991], GSO [1992a].

a. Estimate in italics.
social system, accustomed to applying these assimilative functions to managing household wastes, have yet to adapt to these changes. In particular, patterns of agroecosystem management, which combine gardens, fishponds, and animal pens (called the VAC system), and patterns of dike maintenance, which were acceptable under conditions of lower urban density, are still being applied despite the increased population pressure placed on ecosystems.  

These changes have forced URENCO to experiment with new methods of collection, transport, treatment, and disposal. Among these have been elimination of temporary dumpsites in Hoan Kiem district in favor of a system that combines modified refuse carts with hydraulically loaded trucks, construction of new and larger clay-lined landfills, and experiments in large-scale centralized composting. Increasing ecologic pressure is also forcing URENCO planners to consider new methods of containing wastes at storage and transfer sites.

EMERGING ISSUES

A number of important issues are emerging because of the interplay between continuing and changing features within the refuse and recovery systems. Most notable among these are those factors rising from increasing market competition within the recovery industry, increasing numbers of temporary migrants requiring housing and urban services, changes in URENCO's management and methods, and state-sponsored urban development programs.

Competition

Whether the traditional patterns of communal relations will survive increased market pressure is still a matter of conjecture. Currently, sufficient social pressure can be applied through the community and the local state to reduce the most egregious forms of exploitation.  

Nevertheless, increasing acceptance of market competitive behavior as a social norm could reduce the capacity of the state and community to reign
in capital. Combined with competition from traders and dealers outside the community, this could rapidly result in a system in which communal relations of reciprocity are used as a basis for exploitation through the market, a condition that the model introduced in Chapter 2 would consider to be the result of noncongruence.

Migration
Increases in the number of temporary migrants working in the recovery industry have brought about a proliferation of boardinghouses within O Cho Dua ward. These boardinghouses most often lack urban water, power, and sanitation services. As the new community of migrants becomes more established, they will make increasing demands on the local political administration to provide these services.

These demands will be exacerbated as temporary migrants become permanent residents. During this research, several junk buyers interviewed noted that they had already made this shift. They based their choice on the insufficient size of their farm plots compared to the subsistence and income-earning demands placed on them. Rather than continue to struggle by living in the countryside, they have opted to rent their lands to other farmers and move permanently to Hanoi. More recent research (Li n.d.) has confirmed these trends.

URENCO Methods
Equally important are the emerging issues surrounding changes in URENCO's day-to-day operation. These moves have been initiated in an effort to rationalize the refuse disposal system. Temporary dumpsites, the scavengers' major source of recovered materials, were phased out in 1993 (after this research was completed), while containerization, often discussed by URENCO planners, is still in an experimental stage. Although not yet initiated, URENCO intends to restrict all scavenging to its current and proposed recovery facilities.
Urban Development

Finally, urban development programs sponsored by the Hanoi People's Committee threaten to disrupt the operation and further development of the recovery industry in its core and satellites. In particular, road construction has already forced the relocation of recovery operations along Dai Co Viet, the city's inner ring road. When combined with forced evictions, such actions not only disrupt the operation of recovery businesses but also consume hard-earned assets. Since further construction will bring the road directly through the traditional recovery community's core in O Cho Dua ward, thereby demolishing the recovery community business and housing base, the future looks bleak. New homes are already being constructed along the proposed route of the ring road, as are state-sponsored development projects (a new housing area and expanded city park) and agency expansions (an aquarium to be built by the surface-water exploitation company).

CONCLUSION

Based on the findings of this research, and particularly the model introduced in Chapter 2, several suggestions for managing solid wastes in Hanoi are offered. The similarities of the processes at work in Jakarta (Rebong and Ekna 1979), Bandung (Poebo, Sicilar, and Supardi 1985), Bangkok (Baldisimo, Lohani, and Evans 1988), Manila (Furedy 1990), and Cairo (Haynes and El-Hakim 1979) were examined in arriving at these suggestions for the future.

- Centralization of waste management in URENCO, brought about by ecologic pressure and public health concerns, could result in centralization of access to wastes. Such a process would likely criminalize scavengers, who rely heavily on access points provided by the refuse disposal system, and result in rising levels of recoverable materials reaching municipal landfills. When combined with a closure of access to wastes within the city, this process—as witnessed in Bangkok, Jakarta, and Manila—has resulted in the growth of
dumpsite scavenging communities that, because of increased competition for materials and rent-seeking by public officials and organized gangs, are forced into increasingly dependent relationships and desperate living conditions. By the same process, URENCO's plans to increase the role of centralized composting will reach significant financial impasses as increasing levels of inorganic material change the composition of the waste stream and result in increased sorting costs, equipment failure, and contamination of output with glass, plastic, and other unacceptable components.83

- The recovery system could respond to these challenges as it has in the past, through communal networks based on territorial affiliation. In this scenario, the unwritten rules of waste management would remain in place, despite official opprobrium, and continue to evolve to new conditions, albeit with increased need for secrecy because of pressure from civil authorities. This evolutionary path would likely result in decreased effectiveness in both the recovery and disposal of solid wastes for the same reasons outlined in the previous scenario and, furthermore, create similar conditions of dependency between public and private members of the community, and within the recovery community itself between traders and collectors.

- Recognition of the articulation between the two systems could result in an authorized division of labor and various methods of collaborative effort. In this scenario, the same forces that allowed the recovery industry to exist as a private-sector enclave during the planned economy period would support it during the transition to allocation through markets. This would be based on a recognition of the role of waste recovery in providing low-cost materials to industry, generating employment (both within the industry and through linkages to manufacturing), and conserving resources. Possible outcomes of this strategy could be development of sanitary and
accessible storage and transfer sites within the city, re-development of O Cho Dua's recovery center and expansion of the ring road, and cooperative efforts to reach areas as yet unserved by public refuse collection services. The last effort could be done with URENCO's plans to hire refuse collectors in each of these areas.

The future of managing solid wastes in Hanoi is still uncertain. However, the ecologic and economic pressures that prevail are clearly evident. The social system's response, which must be guided by public policy and yet somehow incorporate the demands of special interests, will require careful planning to include issues of sustainability and equity as well. In the meantime, Hanoi's junk buyers and scavengers will quietly go about plying their trade.
Field research began with assumptions based on case studies of waste recovery and refuse disposal done in other Asian cities. In time, some of these assumptions had to be discarded (municipal refuse workers in Hanoi do not regularly collect discarded materials for resale), while others had to be modified (there was much more communal partitioning of work in Hanoi's recovery industry than anticipated). Nevertheless, by providing testable hypothetical relationships and conditions, assumptions that were developed through a reading of the literature on private waste recovery systems proved critical in moving the research forward.

At the outset, the assumptions were that:

- All metals, and most plastics, glass, bone, paper, carton, repairable goods, and reusable disposable items are recovered.
- Most items of value are removed at the source (households, shops, restaurants, and industries), either through direct reuse or sale.
- The highest value materials, including industrial scrap, are sold to dealers and agents, often through prior contract.
- Alongside their regular duties, municipal refuse workers recover a large part of the valuable wastes left at municipal collection points, especially those left for disposal in commercial and higher income residential areas.
- Itinerant scavengers, working along city streets, at mar-
kets, commercial areas, and transfer points, remove most of the remaining recoverable wastes.

- Because itinerant scavengers are not legally entitled to waste, they are forced to establish relations with shopkeepers and municipal refuse workers who provide them with access in exchange for service, patronage, or other payment. Similar patron-client relations govern relations between scavengers and buyers. As a result, small communities of scavengers may develop around depots. These depots serve as homesites for scavengers and the initial accumulation points for their recovered wastes.

- Due to the effectiveness of the recovery system, few items of value reach municipal dumpsites. As a result, wastes deposited there are dense, largely organic and wet, and contain large quantities of putrescible matter, soil, and other inerts.

- Although little of value remains in proportion to the volume of wastes disposed, the accumulation of wastes at dumpsites provides an opportunity for scavengers to extract substantial quantities of recoverable materials, albeit with a great deal of effort. The high volume of organics at dumpsites is ideal to graze livestock and produce vegetables on composted refuse. Like depots for recovered materials, dumpsites will also be the location of scavenger settlements.

Figure A.1 incorporates these assumptions into a schematic diagram that identifies waste access points, collectors within the recovery system, sources of materials collected, trading hierarchies, and the intermediary role of municipal authorities and employees. As a generalized representation, however, this diagram represents an ideal-typical grammar of the recovery system and its interaction with the refuse system. It overlooks idiomatic relationships that have developed in particular cities and, due to the high level of reduction in such generalized representations, overemphasize the hierarchy within the recovery system.
REFUSE SYSTEM

Sources
- Markets
- Shophouses
- Residences
- Institutions
- Hotels and restaurants
- Industries

Collection Points

Transfer Stations

Disposal Sites

Police and other municipal authorities
Municipal refuse workers

RECOVERY SYSTEM

Itinerant scavengers
Dumpsite scavengers

Junk buyers

Sidewalk depots
Dumpsite depots

Dealers and agents
Small-scale manufacturers

Own use or consumption
Consumption by livestock
Vegetable gardens
Direct sale to consumers
Small shops
Industries

Main route to industries

Figure A.1 Articulation of refuse and recovery systems
Upon review of the schematic, it appeared that the municipal refuse system provided the basis for access to waste materials through its organization for collection, transport, and disposal and through its personnel. This recognition led to preliminary research questions aimed at investigating the organization and capacity of this system.

1. Organization, capacity, and self-rated effectiveness of the public waste disposal system:

- What are the components of the official waste disposal system?
- What are the official collection points?
- What is the frequency of collection?
- How are wastes collected?
- What is the citywide generation rate per day?
- What is the citywide collection rate per day?
- What are the seasonal variations in the volume and generation of wastes?
- What role do wards, districts, and municipal sanitation authorities play in managing solid waste disposal? recovery?
- What are the major problems within the disposal system from the perspective of administrators? refuse workers? residents?
- What types of materials do municipal refuse workers regularly collect for sale?

A second set of research questions were developed around the organization and capacity of the recovery system. Assumptions about the labor force and labor processes had to be tested, as well as those regarding the relationship between levels in the recovery hierarchy.

2. Organization of materials recovery activities:

- What terminology is used for specific occupations within the recovery system? for specific tasks? for tools?
What are the daily routines of itinerant scavengers? junkmen? dumpsite scavengers?
What are the gender and age divisions of occupations and tasks?
Who are the direct buyers of materials collected by junkmen? itinerant scavengers? dumpsite scavengers?
What types of payments are made (include cash and in-kind)?
What are the institutional arrangements that surround these exchanges?
Are patron-client relations evident in these exchanges? On what basis are these relationships maintained?
What are the sale prices for recovered materials at each level in the materials recovery process? How are they determined?
What are the personal aspirations of persons employed in the materials recovery system?

3. Types and volumes of materials recovered from the waste stream:

What types of materials are considered valuable by junkmen? itinerant scavengers? dumpsite scavengers?
What are the types and volumes (by weight) of materials recovered?

4. How and by whom recovered materials are used:

What types of materials are recovered from the waste stream for household consumption?
Are animals raised on organic components of the waste stream? what kinds? by whom? for what purpose?
Are gardens fertilized with organic components of the waste stream? Is compost produced? Is nightsoil used? by whom? how?
Are recovered materials used in local workshops? Do they trade among themselves?
What industries receive recovered materials? what volumes?
Finally, during this research, several important topics arose that were neglected in the original set of research questions. These questions were primarily focused on what were perceived to be communal links between the two systems.

- Is there a communal factor involved in employment within the recovery industry? refuse system?
- What are the historical roots of communal links evident between the public refuse employees and private waste recyclers?
- What are the spatial characteristics of the organization of the waste recovery industry? How does this relate to the refuse system?
- What are the seasonal patterns of work in the recovery industry?
- Under what physical conditions do scavengers and junkmen live?

FIELD RESEARCH METHODS

Field research was carried out in a two-step approach that used qualitative research findings as the basis for quantitative research. The benefit of this approach was that methodological triangulation could be used to compare and evaluate both qualitative and quantitative data. This was extremely important since standardized surveys were administered by volunteers who were given training but little oversight in the field. Equally important, however, was the role qualitative findings played in developing the survey instrument. By the time the survey was designed, the researchers knew the social, economic, and systemic contours of the recovery industry and were able to pinpoint specific issues that required statistical analysis.

Initial Reconnaissance

Field research began with an initial reconnaissance period (June 10–24, 1992) used to determine the spatial and temporal distribution of waste recovery and disposal activities. As the research progressed, observations during this initial in-
vestigation were used to identify specific sites, informants, and official contacts.

Within this period, the researchers (the author and a Vietnamese counterpart) conducted early-morning bicycle tours of the city aimed at uncovering the forms and locations of waste-recovery activities (collection, buying, and trading), talked with scavengers, junk buyers, depot operators, receivers, dealers, and agents, and met with the chairmen of the O Cho Dua People’s Committee (a major center for waste material processing in Hanoi). They also met with the director and assistant director of the Urban Environment Company (URENCO) to discuss the project and terms of cooperation.

These initial findings formed the basis for the schedule of interviews and observations that were conducted over the following six weeks.

Unobtrusive Observation
Throughout the research, time was set aside to observe the recovery system in action as materials were collected and as transactions took place. Over time, the researchers became recognized within the community of recyclers. The stable relations with individual depot operators, receivers, junk buyers, and scavengers established through long-term contact provided important sources for confirming or dispelling information received through more transitory sources.

Observations also provided a reliable means of uncovering aspects of the relationships between buyers and sellers, the prices and volumes of goods collected, daily routines, and personal aspirations.

Structured Interviews
Structured interviews were conducted with administrative staff at each of the four URENCO Environment Enterprises, one of the two Transport Units, the Nightsoil Collection Unit, and the pilot composting plant at Cau Dien. In addition, the researchers interviewed URENCO’s general director, technical director, and planning director. The planning director or
the technical director was also present during most of the interviews with unit staff. These interviews often resulted in group discussions, as those present debated issues brought up by the researchers.

The researchers or their assistants also conducted structured interviews with eight waste material buyers. These interviews were meant to uncover relationships within and between waste-buying households, volumes and types of materials collected, and relationships between sellers and employees. (See Appendix D for a copy of this interview form.)

Open-Ended Interviews
Open-ended interviews were conducted throughout the research. Representatives at each level in the waste-recovery hierarchy, from scavengers, buyers, and dealers to industrial users, were interviewed. These interviews were used to identify the organization of the recovery system, problems within it, and articulation with the refuse system. Some of these interviews also developed into extended life histories. These life histories provided important information about the process of entry into the waste trade, relations between patrons and clients, daily routines, agricultural cycles and temporary migration, types of occupations and materials collected, and the historical development of the waste trade in Hanoi.

Although most of these interviews were with waste buyers, scavengers, and junkmen, about ten workshop and industrial managers were also interviewed. Interviews focused on sources, volumes, and types of waste materials used, equipment and manufacturing processes, business problems, ideas about the relationship between their businesses and the urban environment, and future plans.

Standardized Surveys
A survey of scavengers and junkmen was conducted during the seventh and eighth week of research (late July–early August). This survey was to provide statistical credence to some of the observations made through less formal surveying techniques. (See Appendix D for a copy of this survey.)
Eleven postgraduate students, all participants in a summer training course in human ecology at the Center for Natural Resources Management and Environmental Studies of Hanoi University, were chosen to conduct the interviews. Selection of student interviewers by place of residence, along with a schedule of interview times, was used to provide both a spatial and temporal sample of scavengers and junk buyers working within the city (Figures A.2 and A.3).
The students were asked to interview the second scavenger or junk buyer they saw on their way to class, between 6 and 7 A.M. On their way home, between 2 and 5 P.M., they were asked to interview the second and fourth scavenger or junk buyer they saw. Finally, they were asked to interview the second scavenger or junk buyer they saw in the evening near their homes after 6 P.M.

Interviewers completed 182 surveys over a two-week period, which, as we were to find, coincided with the end of the planting season and the height of the waste-collecting season.

Population Census
During the latter weeks of August, the researchers also conducted a population census. The four central districts of Hanoi were divided into 105 equal blocks of 0.25 square kilometer each (Figure A.4). The researchers randomly (without replacement) selected eight of these blocks, about 7.5 percent of Hanoi’s urban area, for enumeration. Scavengers and junk buyers in each block were counted between 9 and 11 A.M. and between 7 and 9 P.M. These hours were chosen to correspond to the day and night “shifts.” The ratio of scavengers
and junkmen to sample area became the basis for an estimate of the total population for all scavengers and junk buyers working in urban Hanoi.

**PROBLEMS**

**Survey of Scavengers and Junk Buyers**

The sample of scavengers and junk buyers developed through the survey may be slightly skewed toward a particular gender (more males than the population), age group (more young people than the population), or suboccupation (less specialized junk buyers). This is partly due to the invisibility of the population. The student interviewers initially complained of not being able to find any scavengers or junk buyers to

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**Figure A.4**
Approximate location of census blocks
interview. They had become accustomed to ignoring the students. As time went on, however, and the student interviewers became more accustomed to the characteristics of the population, they began to recognize the variety of people and suboccupations involved. Unfortunately, this process of discovery (on the interviewers' part) may be partially reflected in the sample, with the earlier surveys representing more of the student interviewers' preconceived notions of the population than those done later.

Census of Scavengers and Junk Buyers
The researchers had intended to obtain a much larger sample for the census of scavengers and junk buyers but were restricted by time and weather. As originally designed, the census would have provided a 10 percent random-block areal sample. In the end, only 7.5 percent of Hanoi's urban area was sampled.

The results of the census, however, have been confirmed through comparative data. Initially, a number of sources indicated that about 2,000 scavengers and junk buyers from Nam Ha province worked in Hanoi. Interviews suggested that the Nam Ha recycling population was about one-half of the total population. Thus, in June, when this research began, the population of scavengers and junk buyers was estimated to be roughly 4,000. In early August, sources indicated that the Nam Ha population had increased to about 3,000. The first week of August, which corresponds with the end of the summer planting season, coincides with the height of the waste-recycling season. Applying the same ratio between Nam Ha and natives of other provinces suggested at the inception of this research, the population of scavengers and junk buyers was estimated at about 6,000.

This was further confirmed through the transect methods. Waste recyclers were counted along a 3-kilometer section of streets within Hanoi's urban area over a five-day period. At the end of the period, the average number of persons counted per length of roadway was used to make an estimate of the population along all roadways. Again, the outcome.
was 6,000. Unfortunately, because an accurate measure of the length of roadways in Hanoi was unavailable, this estimate could not be confirmed.

As a result, the random-block approach described here had to be used. Two researchers went together to each block on bicycle and counted scavengers and junk buyers along each street within the block in the morning and evening. The final count based on this random-block approach, 5,775, was so close to previous estimates that it was accepted as valid, even though the eight-block sample may have been small.
Supplemental Case Studies

O CHO DUA WARD

Case B.1 Minh Hai Cooperative
Minh Hai cooperative in Hoang Cau village, O Cho Dua ward, raises fish in three lakes and one hatchery within the ward. Two of the lakes (Ho Xuong and Ho Dong Da) are enriched with water from the sewage canal running through the ward, as is the hatchery. The third lake, Ho Hoang Cau, which abuts many recovered materials-trading households, is enriched directly by household refuse. All three lakes are drained yearly, and the accumulated sediment is removed.

The cooperative produces about 1 metric ton of carp per month from Ho Xuong. The name of this lake, literally "bone lake," is based on its secondary use in cleaning ox, buffalo, and pig bone. Bones, collected from restaurants within the city, are packed in burlap sacks and allowed to soak in the lake, where worms remove any remaining meat and cartilage. Clean bone is then taken out and dried along the road separating the lake from the sewage canal. This process yields 6–7 tons of bone every four days. Dried bone is sold to fertilizer, animal feed, and vitamin manufacturers both locally and abroad.

Cooperative members say they have a problem after heavy rain. Incoming water, which is dense with sediment (đặc), lowers levels of dissolved oxygen in the cooperative’s lakes and causes fish to surface to breathe air. Cooperative members apparently are not aware of other forms of contaminants in the waste stream or of techniques, such as aeration, which would increase the productive capacity of the lakes.

The bone-cleaning operations of the cooperative are
managed by a local bone dealer. The dealer, Hang, says she buys about 1 metric ton of bones per day at 400 dong ($0.37) per kilogram. She sells 7 metric tons of bone per week at 500 dong ($0.46) per kilogram.

She pays workers, the majority from Xuan Thuy district, Nam Ha province, 10,000 dong ($0.93) per day to load trucks. Workers said relatives in O Cho Dua invited them to work during planting and harvesting. Like her employees and many of her suppliers, Hang is a native of Xuan Thuy.

Case B.2 Hao Nam Cooperative

Hao Nam, a small village in O Cho Dua ward, has existed for more than 200 years. It is organized as an agricultural cooperative, with its headquarters in an eighteenth-century communal house built by a Ly dynasty prince. The prince’s crown, throne, and boots—symbols of his authority—are enshrined in the communal house. The temple grounds are used as a military camp.

There are sixty-one remaining members in the cooperative, all between fifty-five and seventy years old. Most are women. All were born in this village and say their families have lived here for at least five generations. The lake, which provides income to these women, was formerly a rice field. It was made into a lake when the builders of a nearby factory excavated the field for use as landfill material. For some years after this, the excavated field was still used to grow rice. Eventually, however, rising levels of water pollution killed the rice and forced the women to switch to fish and lotus cultivation. When the water became too dense for the lotus, the women switched to their current agricultural product, spinach (rau muống).

At that time the lake had a surface area of about 6,000 square meters. In recent years, the area has been reduced by about 1,000 square meters through planned filling and the illegal dumping of waste and rubble by residents of a nearby collective housing area.

Despite this, the lake continues to produce 700 kilo-
grams of tilapia and carp every six months. The fish live mainly on the algae produced through introduction of household wastewater into the lake. The fish also eat the spinach that the women plant along the lake's edges. This presents a problem for the women, however, since this spinach is primarily grown to protect the fish from noncooperative residents of the ward. The cooperative's main spinach-growing areas are a small field to the south of the lake and another near its residences.

The women say the lake now suffers from extremely high-suspended sediment levels (đặc) and other forms of pollution. They report that working in the water causes them to break out in rashes. They say the fish is also affected by the polluted water.

The women earn about 3,000 dong ($0.29) per day and work a full thirty-day month. Most live in the original settlement, across the canal from the lake. Here they practice their village routines as if the city had not grown around them. They raise ducks, pigs, and chickens, and grow fruit trees and spinach using a system of agriculture that combines fields, fishponds, and livestock (VAC).

They do not expect their cooperative to last very long. Although the women accept the change, they would like to receive some compensation, such as a stipend, for their loss.

They think the young will not take up this business after them because the government will allow the lake to be filled and will give the land to public officials. Furthermore, when they asked nearby residents to stop throwing rubbish into the lake, the result has been even more rubbish.

Case B.3  A Boardinghouse in O Cho Dua

Twenty men and boys live in the second floor of a bamboo and thatch boardinghouse (nhà trọ) in O Cho Dua ward. An equal number of women and girls live below. The boardinghouse is attached to the back of the brick and mortar home of the landlord. The entrance to the boardinghouse is through his living room.
The landlord is an elderly man, a native of Xuan Thuy and a former employee of the Sanitation Company (CTVS) where he was a driver in the Nightsoil Unit. His wife, also a native of Xuan Thuy, worked for the Sanitation Company as well, beginning during the French colonial period. At that time she worked in the Nightsoil Unit on Giang Vo Street in Thanh Cong ward, nearby. She later worked as a street sweeper for the "Nam Diem" Company, and finally with the Sanitation Company's Environment Enterprise No. 4 located in O Cho Dua.

The second floor of the nhà trọ, where the men live, is about 2.5 meters wide and 5 meters long. The peak of the roof is about 2.5 meters from the floor. The side is about 1-meter high. There are no windows, but the walls are woven bamboo, which allows some air to circulate. Twenty men and boys rent sleeping space here. The cost is 400 dong ($.037) per day. Cooking is done in a small shed of similar construction on the ground behind the guest house. According to the landlord, water is a problem, as the water company turns on the water only for a short time in the morning.

People appear to divide some tasks among themselves (like cooking), but keep their earnings separate. The owner said some of the children compete to see who can earn the most. The children agreed. He said, "Đồng hương, không đồng tiền" (i.e., although the residents were from the same village, they kept their earnings separate).

Everyone in this nhà trọ came from Xuan Hong village. Those in the nhà trọ next door (managed by the landlord's second wife) were from another village. Residents said that this was the typical pattern and that they were introduced by other family members and relatives who preceded them.

All the fifteen residents present during the interview worked in the waste-recovery industry. The stronger men hired themselves out as laborers and porters. The owner of the nhà trọ said that the men work as laborers on an "as needed" basis. Most load scrap metal onto trucks. Other men go about the city on bikes collecting scrap metal. When there
is no work, they stay at home. Two young boys present said they scavenged within Dong Da district on foot from 5 to 11 A.M. or from 3 to 8 P.M. They had no fixed route and would range farther if they were not afraid of getting lost.

The young girls and women who live in the nhà troc also worked in the recovery industry. The young girls scavenged while many of the older women worked as junk buyers. They generally worked in the mornings and returned to O Cho Dua around mid-day.

The average daily income of the children and women who collect waste materials was reported to be 2,500 dong ($.23) per day. A good day brings in about 5,000 dong ($.46). When it rains, they do not go out.

All the men in this guest house said they have land in their home village. With the change in economic institutions, the cooperative to which these men are attached allotted five pieces of land of varying quality to each person. Each piece of land is 36 square meters. The total allotted per person is thus 180 square meters (one-half sào). In a good year, with two crops, these lands can produce 120 kilograms of rice.

The cooperative provides technical assistance and manages the irrigation system. For these services, and tax on the land, the cooperative requires 50 percent of output in cash or in kind.

All those present in this discussion said they came to Hanoi to earn cash to pay for taxes, repair or construct houses, and buy fertilizer and pesticides. Some also buy consumer goods like radios. Most said they brought home gifts like pig fat, good quality monosodium glutamate, detergent, and other food not available in rural areas.

The men spent only two months of the year in their homes. The rest of the year they were either in Hanoi or Laos. Typically, they are in Hanoi from May to October. On October 1, they return to their villages to harvest rice. The trip takes four hours to cover 120 kilometers of rough road. The men say the trip is more tiring than work. While they are home, the men do all the heavy work necessary to bring
in the harvest and prepare for the next planting. They also use the time to repair homes. They remain on their farms for two weeks, then they return to Hanoi.

They return home again at or near Tết, the Vietnamese New Year, in late January or early February. They remain in their villages until early February, when they return to Hanoi. In early May, they return to their villages to harvest the winter crop and prepare fields for the summer rice crop.

Sometimes the schedule is altered to include work in Laotian forests. They are paid by Laotians to cut timber and collect forest products. All the men said they preferred work in Hanoi, however, because timber cutting in Laos is dangerous and malaria is common. Timber operations are also managed by a Nam Ha native.

One man commented that by working in the recovery industry in Hanoi, in four years, he could earn enough money to get married, build a house, and buy furniture.

SCAVENGERS AND JUNK BUYERS

Case B.4 A Scavenger Couple at Lenin Park
Anh and Chi, a married couple originally from Vinh Phu, have been working as scavengers within the city for more than twenty years. They live in Lenin Park, a large park in the southern end of the French Quarter. They have three children.

Anh and Chi work from 5 to 10 P.M. and from 5 to 9 A.M. At night, they collect from the URENCO temporary dumpsites and refuse carts. In the morning, after a few hours of sleep, they sell their evening's cache to a depot operator near the park.

They generally sort their goods by material type prior to sale: plastic bags, plastic pieces, scrap metal, aluminum, and glass. For their effort, each usually earns about 10,000 dong ($0.93) per day. This morning, because of poor weather, the two earned 14,500 dong ($1.34).
Case B.5 Scavenging at Tam Hiep Dump

Tam Hiep dump was opened in November 1990 and had an expected life of two years. In early July 1992, about one week after a major storm, a URENCO official delivered a 30-million-dong money order (US$2,778) to the neighboring agricultural cooperative as payment for 1,100 kilograms of fish and 5,400 square meters (15 mâu) of rice destroyed by acid leachate during the storm. The dumpsite is not separated from surrounding fields and ponds by any control structure.

We arrived at the dump at about 3 P.M. A truck was being manually unloaded by a group of male scavengers. Other people were sorting materials. Some were digging through waste piles. The children said they came from Vinh Ninh village, nearby. They worked in the dump during their summer holiday. An older woman said there were several hundred people at the dump at night. She said children could earn 3,000 dong ($0.28) per night; men, 5,000 dong ($0.46); and senior women like her, only 2,000 dong ($0.19). She said people come in the morning to buy materials. Children gave their earnings to their mothers.

A young boy said that he did not want to talk about his work because a reporter had recently written that waste diggers at the dump were covered with “flies like black beans” (Phong 1992). He asked, “Look, do you see flies? I’m not sick; nobody gets sick; and there are no flies.” He was, however, willing to name the kinds of things he regularly collected. As he began to talk, four adult women and nine other children joined in. The leader of the discussion was a woman in her mid-thirties, a resident of neighboring Vinh Ninh village, who had been working at the dump since it opened.

The group decided that the materials most commonly collected at the dump were hard plastic pieces, soft plastic bags, plastic detergent bottles, bone, carton, mixed waste paper, broken glass, bottles, and scrap metals. Vinh Ninh villagers collected tree limbs for use as firewood; leaves were
Many materials collected at the dump are sorted and sold to specialized depot operators on site. Rubber dealers buy bicycle tires for 50 dong ($0.0046) each and auto tires for 100 dong ($0.009). The same dealers buy latex vapor seals pulled from bottle caps. Other dealers buy scrap metal. The most common at the dump is aluminum. Scavengers collect aluminum pull tabs, aluminum beverage cans, and steel beverage cans. The aluminum tops of the steel beverage cans are cut to separate materials. Aluminum sells for 300 dong ($0.028) per 100 grams. Broken glass is sold for 100 dong ($0.009) per kilogram. Soft plastic bags (LDPE) are sold for 3,000 dong ($2.8) per kilogram washed and dried. Hard plastic bags (HDPE) in the same state sell for 300 dong ($0.028) per kilogram. Unwashed soft plastic bags are likewise sold for 300 dong ($0.028) per kilogram.

The woman in her mid-thirties explained that work at the dump follows the agricultural cycle. Residents of Vinh Ninh village raise two rice crops—one in spring (January–May) and the other in summer (June–October) with an average yield of 100 kilograms of rice per 360 square meters (one sào). Women are busy during planting and harvesting. Between these periods, they have time to come to the dump.

The most important period, in meeting basic household necessities, is late spring. Because the spring crop grows slowly, toward the end of the spring growing season, before harvesting, many of the villages' households run out of rice. Many of these households come to the dump to earn money.

The woman who led the discussion said she sells recovered materials from her home. Most of the time, enterprises come to her. When business is slow, however, she has to deliver. She said that most people work at the dump early in the morning, before the bulldozers begin flattening the piles deposited overnight.

She estimated that about fifty people work between 10 P.M. and midnight, when the majority of the city's refuse is collected for use as green manure and dead animals were taken for use as pig food.
transported to the dump. She said that most were residents of Vinh Ninh, but that because the volume of valuable materials is low, competition for such things as plastic detergent bottles is high.

When asked why she did not go to the city to gather discarded materials, this same woman said that Tam Hiep was the last place to get something of value out of wastes. She said that although she generally works from 4 A.M. to 4 P.M., other people come later in the morning and leave with URENCO staff in the evening, between 5 and 6 P.M.

She said she had no relationship with URENCO workers, but that URENCO workers pay scavengers 3,000 dong ($0.28) to clean their trucks in the nearby fish pond.

**Case B.6 Tam Hiep by Night**

Tam Hiep, by night, is apocalyptic. The dump sits at the end of a long lane in a rural area that, once covered in darkness, frames the dumpsite in a black curtain. Dump trucks rumbling in and out sway with the bumps in the road, their lights searching the darkness, first above, then below, then sweeping right and left. At the end of the road, a clutch of lights circles the rear end of a truck. As the truck leaves, the lights take shape, forming a ring, like candles on a birthday cake.

The ring is made up of a group of fifty people, mostly children and teens, holding burning bicycle tires above their heads (and above the heads of others) as they dig through the freshly dumped piles of refuse looking for recoverable material. Most of them wear rubber boots and are from the neighboring village of Vinh Ninh.

A thirty-year-old woman, who lived in O Cho Dua, offered her comments. She said that children start working at the dump when they are seven or eight years old. The children present said they worked all year, going to school in the mornings and working at night from 7 P.M. to 2 A.M.

On a good night, they each earn 3,500 dong ($0.32). Most nights, however, they earn between 2,225 dong ($0.21) and 3,000 dong ($0.28). They separate plastics from other mixed
materials. The remaining mixed wastes are sold together for 50 dong ($.0046) per kilogram. Dirty plastic bags are sold for 180 dong ($.0017) per kilogram.

When asked who the boss was, the thirty-year-old woman from O Cho Dua replied, “We are our own bosses.” When asked why they worked at the dump rather than in the city, this same woman said that upper-class people look down on them. Life at the dump, according to her, is free from restrictions.

Case B.7 Bottle Buyer on Le Thanh Tong
Anh is a bottle buyer. He purchases bottles from restaurants and guest houses in the French Quarter of the city. He regularly buys bottles and aluminum cans from the operators of a small refreshment stand at the Ministry of Education Guest House, 23 Le Thanh Tong. Every day, he visits restaurants and hotels along his route, collecting bottles and cans if there is a sufficient quantity. He buys beer cans for 100 dong ($.009) and beer bottles for 140 dong ($.013). He sells the latter for 180 dong ($.017). He is not committed to a particular buyer; instead, he seeks out the best price from any of the several buyers along his route. He does this to maximize the number of collection trips he can make and to shorten the travel distance. He carries up to 400 bottles in one load.

RECEIVERS AND DEPOT OPERATORS

Case B.8 A Bottle Dealer on Dai Co Viet
Lien, thirty-one and the mother of two children, operates a bottle business on the corner of Dai Co Viet and Ba Trieu Streets in Hanoi. She graduated from Hanoi University’s College of Commerce in 1982 with a degree in accounting. Upon graduation she was offered a public sector management position in any of the provinces outside Hanoi, Hai Phong, or Ho Chi Minh City. Since her family and friends were in Hanoi, however, she decided to forego placement and attempt a life of her own in private business.

Lien’s family is originally from Ha Dong, a suburb south
of Hanoi. Both her parents worked for government agencies and are now retired and living in Hanoi. Lien’s husband studied at the Hanoi University’s College of Construction. He is a civil engineer and works for the State Hydroelectric Engineering Company in Hoa Binh.

In 1980, Lien began work as a clothing salesperson in a shop on Bach Mai Street, not far from her home on Dai Co Viet. She quit that job in 1984 and spent the next four years in a variety of jobs, beginning as a seamstress. While she was still selling clothes, however, she met a young man, a student at Hanoi University’s Polytechnic College, who introduced her to the glass business.

This man’s family operated a glass factory in Nam Dinh, an industrial town southeast of Hanoi. He collected empty and broken bottles at the college during the week. When he had collected enough to fill a cart, he would deliver them to his parents’ factory. His parents remelted the glass to manufacture beer cups, ink wells, and small bottles.

At some point, Lien’s friend suggested that she become his business partner. Although she declined, Lien’s involvement with the young man captured her interest in the bottle business. In 1988, she began to research the market for empty and broken bottles. In 1989, she decided to enter business on her own.

Lien is a bottle dealer, at the final stage before bottles are returned or sold. Lien says there are more than 100 bottle dealers in Hanoi. Her shop collects from other dealers who are not as conveniently located, from itinerant bottle buyers who collect from households, restaurants, and hotels throughout the city, and from scavengers. She has a clientele of about twenty-five regular suppliers. She gives daily working capital to a very few of the men and women. Lien says each bottle buyer, driving a bicycle equipped with two wire or wicker baskets (xe thô), is capable of carrying from 200 to 400 bottles per trip. One wire basket alone can hold about fifty large beer bottles. By laying a loaded rice sack over the top of the two wire baskets on the back of the bike, the load can be increased to 200 bottles. Lien supplies these bags to her cli-
Bamboo baskets hold 80 to 100 bottles each. The same configuration (two baskets and a sack) can accommodate 300 large beer bottles or 400 small beer bottles. She says many bottle buyers deliver three or four loads per day to her shop.

Lien buys large green beer bottles for between 220 and 250 dong ($0.02-$0.023) each. The small brown bottles are bought from between 120 and 150 dong ($0.009-$0.014) each. She buys liquor bottles for 200 dong ($0.019) each.

Bottles are counted and sorted as they are unloaded from bicycles. Trusted clients count their goods and report to Lien, whose large vinyl purse serves as the payroll office. When the shop is full of bottle buyers delivering their goods, Lien allows them to count by twos or fours on their own as she watches from a distance. Disagreements are rare.

Lien says that most of the bottle buyers are men, because the work and the loads are heavy and require strength. One sack of 100 beer bottles weighs roughly 50 kilograms. Because of the weight, at least five men are required to load them onto trucks. Two men lift the sacks onto another's shoulder. The porter then carries the sack to the back of a 10-ton Soviet or German (IFA) truck, where two other men wait to stack the sacks as the porter dumps them.

All the beer bottles that Lien buys are returned to three Chinese breweries. The breweries in Ho Nam and Ly Tuyen use the large green bottles; breweries in Guangzhou use the small brown bottles. Clear glass bottles go to fish-sauce manufacturers in southern Vietnam, liquor manufacturers, and small distillers in Hanoi. She returns the Kim Boi mineral water bottles to agents of the bottler and to manufacturers of pirate mineral water. Broken bottles and bits of glass go to any of the numerous glass manufacturers in the city.

When she first entered this business, Lien collected everything and, consequently, was burdened with many fake bottles. Over time, however, her employees taught her how to distinguish the real from the fake and the reusable from the discards. She is careful to share this knowledge with her clients as well.

Most of her employees are friends and relatives who
help her as needed. She pays one man to guard the site at night, hires men to help her load trucks as needed, and relies on friends and family to help her count bottles as they come in. Lien's family lives about a block from her shop.

The 400-square-meter site she operates from is rented from a friend who manages it for a Vietnamese company that intends to build a ten-story hotel. The group that plans to build the hotel has received permission from the Hanoi People's Committee and has already signed a contract with a construction company. Construction began at the end of 1992, forcing Lien to look for another location. Her clients like the current site because it is conveniently located at the intersection of two major roads on the southern edge of the central city. The site is also convenient for Lien, who grew up in the neighborhood and whose family and friends all live nearby.

Lien says she is arranging for a new site that is just as well situated. However, she hesitates to discuss the details for fear that someone will subvert the negotiations. In mid-September 1992, Lien was evicted from her site. She moved across the street to a sidewalk on Dai Co Viet. She was later evicted from this site. She has reopened a smaller shop nearby, on Mai Hac De Street. Her sister maintains a smaller depot on Dai Co Viet.

Three or four trucking companies in Hanoi are experienced in the bottle business. Lien sells her bottles to these companies directly. They transport them to the border, resell them to their Chinese counterparts, and return to Hanoi with fresh loads of beer or other goods. Her contracts provide for regular pickup of empty bottles. Trucks usually arrive at about 5 P.M. The number of trucks per day or week depends on the demand for bottles in China. During peak demand, she loads two trucks that carry 20,000 bottles per day. During slack periods or when the border is closed, she sends 20,000 bottles every other day.

The transporters have contracts with Chinese breweries. Drivers leave Hanoi in the evening and spend the night in Lang Son, 200 kilometers to the north. The next morning, bottles are taken to Tan Thanh, a city near Lang Son that
straddles the border between China and Vietnam, where they are purchased by agents of Chinese breweries. By 10 A.M., bottles have been sold and the trucks have been reloaded for the return trip to Hanoi.

An alternative route passes through Lao Cai and into Quan Ninh, China. Vietnamese transporters sell to Vietnamese brokers in Lao Cai who then sell the bottles to representatives of Chinese state industries. When the border is closed, ethnic minorities are hired to carry the bottles across to their Chinese counterparts.

INDUSTRIAL USERS OF RECOVERED MATERIALS

Case B.9 Thanh Dong Cooperative.
Thanh Dong cooperative in O Cho Dua ward, Dong Da district, Hanoi, produces electrical wire from scrap copper. At its peak during the subsidized period, the cooperative employed sixty people and produced several tons of wire per day. It is currently in disrepair. The manager, who now also operates a private business out of his home, gives three reasons for this failure: lack of credit, competition from untaxed imports, and antiquated technology.

Lack of credit has limited the amount of supplies the company can buy. In the past, credit was handled by chits that could be converted to goods and services from other firms. With the introduction of cash transactions, the Thanh Dong cooperative found itself unable to collect sufficient amounts of materials to meet contract obligations. Consequently, their main buyer, the state-owned electric company, abandoned them for other sources. The cooperative now must alternate between stockpiling and production.

Competition has come in the form of cheap untaxed imports and untaxed private domestic products. The cooperative manager and staff say they cannot compete fairly when prices are undercut through avoidance of taxes. As an officially registered enterprise, they cannot avoid such taxes.

Finally, declining business has resulted in a general lack of investment capital needed to improve production tech-
nology. The antiquated furnaces employed by the cooperative were adequate when output and employment were the objectives of work rather than productivity and profitability. Now these primitive tools are a detriment.

Case B.10 Dong Thanh Cooperative

Dong Thanh cooperative, located on the southern shore of West Lake, has been in operation since 1958. It formerly produced high-quality paper (giấy cao cấp), roneo paper, school paper, toilet paper, and kraft paper. Currently, its primary product is firecracker paper. This paper is made by traditional hand manufacture from a mixture of waste carton, newspaper, scrap from a bamboo chopsticks factory, and bagasse.

Its material inputs are derived from both urban and rural agricultural waste. Two metric tons of scrap newspaper is purchased each month from Nhan Dan, the official newspaper of the Communist Party, at 500 dong ($0.046) per kilogram, undelivered. Once every six months the cooperative buys 20 tons of bagasse (bã miá) under contract with a sugar company. Carton is regularly purchased from private agents at 800 dong ($0.074) per kilogram, delivered.

Five years ago, during the planned economy period, the cooperative operated five pulping mills. Currently, the cooperative processes waste paper in a small pulping mill. Although it has a larger mill, the cooperative does not use it because no market is available for its output. Cooperative members think the problem is the type of paper they produce, but they do not have the money to change their product line.

The cooperative's manager thinks that the problems faced by the company are due to a lack of contracts. In the past, the cooperative produced paper for a number of companies, including a pharmaceutical company. With the change in economic institutions, which has taken place in Vietnam during recent years, some of the companies with whom the cooperative had contracts closed while others found different suppliers. The cooperative's managers have tried to market other products, but over time have decided to limit them-
selves to the low-quality paper best suited to their labor-intensive production system. Although some of this paper becomes “hell” money (giấy vàng mả) used for religious ceremonies throughout the city, its major contract is with a military group (đơn vị bộ đội) that uses the paper in its production of firecrackers. The heaviest season for production is around Tết and during the late fall wedding season.

The cooperative’s manager would like to make traditional silk and mulberry bark paper but says the price for these papers is too low and the market is weak. Because waste carton is used as primary input, the cooperative is restricted to producing low-grade papers.

The company pays a 4 percent tax on its income and a 4 percent value-added tax. The average wage of cooperative members is 40,000 dong ($3.70) per month. The cooperative manager and pulp maker earn higher salaries—60,000 dong ($5.56) per month. The cooperative is managed by the Ba Dinh district industrial office, which is managed by the Hanoi industrial office, which is under the Hanoi People’s Committee. It has never received investment capital from the district industrial office. Between 1980 and 1983, it borrowed working capital from the state bank at 2.5 percent interest rate. It would like to borrow more money but cannot afford the current 3.7 percent interest rate. Consequently, workers contribute part of their income to a capital fund. The entire fund has been applied to the daily working capital, however. Daily operating cost is 1.4 million dong ($129.62), most of which is applied to cost of materials. Products are sold three times a month, turning over about 10 million dong ($925.26) per sale.

Case B.11 Huong Tuyet Production Group
The Huong Tuyet Production Group manufactures about 50 metric tons of paper per month. It is the second largest private paper manufacturer in Hanoi and has been in operation since 1990. The owner, Mr. Huong, says there are twenty other private paper companies in the city. Competition among them is very high.
Huong Tuyet Production Group uses 700–800 kilograms of waste bindery paper and 1 ton of cardboard in its production each day. Bindery paper is delivered by fifteen people who either work for paper dealers or have contracts to buy scrap from other paper companies. The company also has contracts with department stores to deliver waste cardboard. Every month, this amounts to 21–24 metric tons of waste bindery paper and 30 metric tons of cardboard.

The firm employs fifteen people and operates three shifts per day, seven days per week. Mr. Huong and his wife Tuyet are the company's managers. Although Huong is a dentist by training, he says this is his main profession. He comes from a family of traditional paper makers.

The company rents its 250-square-meter production site from the Railroad Authority at 800,000 dong ($74) per month on a five-year lease. The company's total overhead is 90 million dong ($8,333) per month.

The firm produces eighteen tons of typing paper, which is made from bindery scrap, per month under contract to local wholesalers. Waste carton is used to make kraft paper. Other papers are made from a mixture of both. Kraft paper, toilet paper, and other papers are sold directly to retailers. The firm has a contract with one retailer who purchases 20 metric tons of tissue paper, used to make "hell" money, each month. The company also produces 12–20 metric tons of toilet paper per month and an unspecified amount of kraft paper.

The company's two paper mills were designed by Mr. Huong and constructed by a local machinist from parts purchased in O Cho Dua.

In late 1992, the Railroad Authority, owner of the company's production site, raised the rent, forcing Mr. Huong to move. The paper company was re-established in the Thanh Xuan area of southern Hanoi at a site owned by the Ministry of Foodstuffs. When production expanded to its former level, this Ministry also raised the rent. Mr. Huong abandoned this site in mid-1993. His strategy as of August 1994 was to construct several smaller, less conspicuous plants.
Tabular Data

Table C.1 Estimate of total population of scavengers and junk buyers working in urban Hanoi, 1992

<table>
<thead>
<tr>
<th>Block</th>
<th>Junk buyers</th>
<th>Scavengers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>84</td>
<td>28</td>
<td>112</td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>7</td>
<td>32</td>
</tr>
<tr>
<td>88</td>
<td>42</td>
<td>26</td>
<td>68</td>
</tr>
<tr>
<td>29</td>
<td>37</td>
<td>22</td>
<td>59</td>
</tr>
<tr>
<td>27</td>
<td>21</td>
<td>12</td>
<td>33</td>
</tr>
<tr>
<td>21</td>
<td>35</td>
<td>30</td>
<td>65</td>
</tr>
<tr>
<td>100</td>
<td>38</td>
<td>15</td>
<td>53</td>
</tr>
<tr>
<td>41</td>
<td>55</td>
<td>20</td>
<td>75</td>
</tr>
<tr>
<td>Total enumerated</td>
<td>253</td>
<td>132</td>
<td>385</td>
</tr>
<tr>
<td>Area surveyed (km²)</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
</tr>
<tr>
<td>Total survey area (km²)</td>
<td>26.25</td>
<td>26.25</td>
<td>26.25</td>
</tr>
<tr>
<td>Estimate of citywide population</td>
<td>3,795</td>
<td>1,980</td>
<td>5,775b</td>
</tr>
<tr>
<td>Percent</td>
<td>65.7</td>
<td>34.3</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: See Appendix A for an explanation of the sampling method and Figure A.4 for the location of blocks.

a. Block 32 was enumerated on August 15, 1992 (lunar calendar). The first and fifteenth of each month are important religious holidays. Both the level of wastes and the number of waste collectors increase on these days. Data from this day have not been included in this population estimate.

b. In August, at the peak of the waste-recovery season, scavengers and junk buyers comprised 2.6 percent of the city’s 1990 industrial labor force of 216,200 persons (GSO 1992, 16).

Table C.2 Age and gender distribution of sample (% by occupation)

<table>
<thead>
<tr>
<th>Age group</th>
<th>Female scavengers</th>
<th>Male scavengers</th>
<th>Female junkwomen</th>
<th>Male junkmen</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-19</td>
<td>8.7</td>
<td>10.1</td>
<td>5.4</td>
<td>1.3</td>
<td>25.5</td>
</tr>
<tr>
<td>20-29</td>
<td>6.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.7</td>
<td>18.8</td>
</tr>
<tr>
<td>30-39</td>
<td>6.0</td>
<td>4.7</td>
<td>8.7</td>
<td>3.4</td>
<td>22.8</td>
</tr>
<tr>
<td>40-49</td>
<td>6.0</td>
<td>4.7</td>
<td>6.7</td>
<td>4.7</td>
<td>22.1</td>
</tr>
<tr>
<td>&gt; 49</td>
<td>2.0</td>
<td>2.0</td>
<td>4.7</td>
<td>2.0</td>
<td>10.7</td>
</tr>
<tr>
<td>Total</td>
<td>28.9</td>
<td>25.5</td>
<td>29.5</td>
<td>16.1</td>
<td>100.0</td>
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</tbody>
</table>
### Table c.3 Equipment (by occupation and gender)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Scavengers</th>
<th></th>
<th>Equipment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Persons</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Iron hook</td>
<td>78.7</td>
<td>70</td>
<td>Scales</td>
<td>68.1</td>
</tr>
<tr>
<td>Bamboo tongs</td>
<td>48.3</td>
<td>43</td>
<td>Pannier</td>
<td>66.7</td>
</tr>
<tr>
<td>Pannier</td>
<td>38.2</td>
<td>34</td>
<td>Bicycle</td>
<td>22.2</td>
</tr>
<tr>
<td>Handbag</td>
<td>36.0</td>
<td>32</td>
<td>Handbag</td>
<td>16.7</td>
</tr>
<tr>
<td>Basket</td>
<td>36.0</td>
<td>32</td>
<td>Cargo bike</td>
<td>16.7</td>
</tr>
<tr>
<td>Bicycle</td>
<td>28.1</td>
<td>25</td>
<td>Basket</td>
<td>11.1</td>
</tr>
<tr>
<td>Scales</td>
<td>4.5</td>
<td>4</td>
<td>Other (large sack)</td>
<td>9.7</td>
</tr>
<tr>
<td>Cargo bike</td>
<td>3.4</td>
<td>3</td>
<td>Iron hook</td>
<td>2.8</td>
</tr>
<tr>
<td>Boots</td>
<td>3.4</td>
<td>3</td>
<td>Bamboo tongs</td>
<td>2.8</td>
</tr>
<tr>
<td>Other (large sack)</td>
<td>3.4</td>
<td>3</td>
<td>Boots</td>
<td>2.8</td>
</tr>
<tr>
<td>Gloves</td>
<td>2.2</td>
<td>2</td>
<td>Gloves</td>
<td>1.4</td>
</tr>
</tbody>
</table>

*Female %*  
*Male %*

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Female</th>
<th>Male</th>
<th>Equipment</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron hook</td>
<td>74.4</td>
<td>84.6</td>
<td>Iron hook</td>
<td>80.0</td>
<td>63.2</td>
</tr>
<tr>
<td>Tongs</td>
<td>58.1</td>
<td>53.8</td>
<td>Bicycle</td>
<td>71.1</td>
<td>52.6</td>
</tr>
<tr>
<td>Basket</td>
<td>41.9</td>
<td>43.6</td>
<td>Pannier</td>
<td>43.6</td>
<td>47.4</td>
</tr>
<tr>
<td>Pannier</td>
<td>39.5</td>
<td>35.9</td>
<td>Tongs</td>
<td>13.3</td>
<td>42.1</td>
</tr>
<tr>
<td>Handbag</td>
<td>39.5</td>
<td>30.8</td>
<td>Handbag</td>
<td>13.3</td>
<td>26.3</td>
</tr>
<tr>
<td>Bicycle</td>
<td>11.6</td>
<td>30.8</td>
<td>Basket</td>
<td>11.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Scales</td>
<td>7.0</td>
<td>5.1</td>
<td>Cargo bike</td>
<td>4.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Gloves</td>
<td>2.3</td>
<td>5.1</td>
<td>Iron hook</td>
<td>2.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Boots</td>
<td>2.3</td>
<td>2.6</td>
<td>Tongs</td>
<td>2.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Other</td>
<td>2.3</td>
<td>2.6</td>
<td>Boots</td>
<td>2.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Cargo bike</td>
<td>0.0</td>
<td>0.0</td>
<td>Gloves</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

*Female %*  
*Male %*

n = 89  
n = 72  
n = 43  
n = 39  
n = 45  
n = 19
Table c.4 Materials collected

A. By occupation and gender

<table>
<thead>
<tr>
<th>Materials</th>
<th>Scavengers</th>
<th></th>
<th>Junk buyers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Persons</td>
<td>%</td>
<td>Persons</td>
</tr>
<tr>
<td>Plastic bags</td>
<td>98.7</td>
<td>75</td>
<td>Scrap metal</td>
<td>77.2</td>
</tr>
<tr>
<td>Bottles and aluminum cans</td>
<td>84.2</td>
<td>64</td>
<td>Bottles and aluminum cans</td>
<td>75.4</td>
</tr>
<tr>
<td>Paper</td>
<td>78.9</td>
<td>60</td>
<td>Plastic pieces</td>
<td>73.7</td>
</tr>
<tr>
<td>Scrap metal</td>
<td>75.0</td>
<td>57</td>
<td>Paper</td>
<td>70.2</td>
</tr>
<tr>
<td>Carton</td>
<td>39.5</td>
<td>30</td>
<td>Carton</td>
<td>49.1</td>
</tr>
<tr>
<td>Other, primarily broken glass</td>
<td>35.5</td>
<td>27</td>
<td>Other, primarily bone</td>
<td>31.6</td>
</tr>
<tr>
<td>Nightsoil</td>
<td>0.0</td>
<td>0</td>
<td>Nightsoil</td>
<td>0.5</td>
</tr>
</tbody>
</table>

n = 77

<table>
<thead>
<tr>
<th>Gender</th>
<th>Female %</th>
<th>Male %</th>
<th>Female %</th>
<th>Male %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic</td>
<td>100.0</td>
<td>Plastic</td>
<td>94.3</td>
<td>Paper</td>
</tr>
<tr>
<td>Bottles</td>
<td>87.2</td>
<td>Paper</td>
<td>82.9</td>
<td>Plastic</td>
</tr>
<tr>
<td>Scrap metal</td>
<td>74.4</td>
<td>Scrap metal</td>
<td>80.0</td>
<td>Bottles</td>
</tr>
<tr>
<td>Paper</td>
<td>71.8</td>
<td>Bottles</td>
<td>80.0</td>
<td>Scrap metal</td>
</tr>
<tr>
<td>Other</td>
<td>41.0</td>
<td>Carton</td>
<td>34.3</td>
<td>Carton</td>
</tr>
<tr>
<td>Carton</td>
<td>38.5</td>
<td>Other</td>
<td>28.6</td>
<td>Other</td>
</tr>
<tr>
<td>Nightsoil</td>
<td>0.0</td>
<td>Nightsoil</td>
<td>0.0</td>
<td>Nightsoil</td>
</tr>
</tbody>
</table>

n = 39

n = 35

n = 31

n = 19

B. By occupation, gender, and number of different types of materials collected (in %)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scavengers</td>
<td>0.0</td>
<td>6.6</td>
<td>23.7</td>
<td>30.3</td>
<td>30.3</td>
<td>9.2</td>
</tr>
<tr>
<td>Female</td>
<td>0.0</td>
<td>10.3</td>
<td>23.1</td>
<td>23.1</td>
<td>30.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Male</td>
<td>2.9</td>
<td>2.9</td>
<td>22.9</td>
<td>37.1</td>
<td>25.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Junk buyers</td>
<td>21.1</td>
<td>1.8</td>
<td>15.8</td>
<td>15.8</td>
<td>28.1</td>
<td>17.5</td>
</tr>
<tr>
<td>Female</td>
<td>6.5</td>
<td>0.0</td>
<td>19.4</td>
<td>12.9</td>
<td>32.3</td>
<td>25.8</td>
</tr>
<tr>
<td>Male</td>
<td>42.1</td>
<td>5.3</td>
<td>10.5</td>
<td>21.1</td>
<td>15.8</td>
<td>5.3</td>
</tr>
</tbody>
</table>

n = 100.0

n = 100.0

n = 100.0

n = 100.0
<table>
<thead>
<tr>
<th>Source</th>
<th>Scavengers %</th>
<th>Scavengers Persons</th>
<th>Source</th>
<th>Junk buyers %</th>
<th>Junk buyers Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dumpsites</td>
<td>70</td>
<td>52</td>
<td>Streets</td>
<td>86</td>
<td>49</td>
</tr>
<tr>
<td>Streets</td>
<td>64</td>
<td>47</td>
<td>Households</td>
<td>77</td>
<td>44</td>
</tr>
<tr>
<td>Waste bins</td>
<td>64</td>
<td>47</td>
<td>Restaurants</td>
<td>40</td>
<td>23</td>
</tr>
<tr>
<td>Refuse carts</td>
<td>35</td>
<td>26</td>
<td>Institutions</td>
<td>25</td>
<td>14</td>
</tr>
<tr>
<td>Households</td>
<td>28</td>
<td>21</td>
<td>Hotels</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>Institutions</td>
<td>14</td>
<td>10</td>
<td>Other</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>Restaurants</td>
<td>5</td>
<td>4</td>
<td>Workshops</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Hotels</td>
<td>4</td>
<td>3</td>
<td>Dumpsites</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>3</td>
<td>Waste bins</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Workshops</td>
<td>1</td>
<td>1</td>
<td>Refuse carts</td>
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<td>0</td>
</tr>
<tr>
<td>n = 74</td>
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<td></td>
<td>n = 57</td>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Female %</th>
<th>Male %</th>
<th>Female %</th>
<th>Male %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streets</td>
<td>68.6</td>
<td>Dumpsites</td>
<td>72.2</td>
</tr>
<tr>
<td>Waste bins</td>
<td>65.7</td>
<td>Waste bins</td>
<td>63.9</td>
</tr>
<tr>
<td>Dumpsites</td>
<td>62.9</td>
<td>Streets</td>
<td>55.6</td>
</tr>
<tr>
<td>Households</td>
<td>40.0</td>
<td>Refuse carts</td>
<td>38.9</td>
</tr>
<tr>
<td>Refuse carts</td>
<td>34.3</td>
<td>Households</td>
<td>16.7</td>
</tr>
<tr>
<td>Institutions</td>
<td>11.4</td>
<td>Institutions</td>
<td>13.9</td>
</tr>
<tr>
<td>Hotels</td>
<td>5.7</td>
<td>Restaurants</td>
<td>5.6</td>
</tr>
<tr>
<td>Restaurants</td>
<td>5.7</td>
<td>Hotels</td>
<td>2.8</td>
</tr>
<tr>
<td>Other</td>
<td>5.7</td>
<td>Other</td>
<td>2.8</td>
</tr>
<tr>
<td>Workshops</td>
<td>2.9</td>
<td>Workshops</td>
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<td>n = 35</td>
<td>n = 36</td>
<td>n = 35</td>
<td>n = 17</td>
</tr>
</tbody>
</table>
### Table c.6 Point of sale (by occupation and gender)

<table>
<thead>
<tr>
<th>Point of sale</th>
<th>Scavengers %</th>
<th>Scavengers Persons</th>
<th>Junk buyers %</th>
<th>Junk buyers Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misc., OCD</td>
<td>60.0</td>
<td>48</td>
<td>Misc., street</td>
<td>57.1</td>
</tr>
<tr>
<td>Misc., street</td>
<td>35.0</td>
<td>28</td>
<td>Misc., shop</td>
<td>44.4</td>
</tr>
<tr>
<td>Misc., shop</td>
<td>32.5</td>
<td>26</td>
<td>Bottles, street</td>
<td>22.2</td>
</tr>
<tr>
<td>Metal, OCD</td>
<td>13.8</td>
<td>11</td>
<td>Misc., OCD</td>
<td>22.2</td>
</tr>
<tr>
<td>Paper, OCD</td>
<td>13.8</td>
<td>11</td>
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</tr>
<tr>
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<td>Bottles, OCD</td>
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</tr>
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<td>Workshop</td>
<td>9.5</td>
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</table>

**n = 80**

<table>
<thead>
<tr>
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</tr>
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<td>16.2</td>
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</tr>
<tr>
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<td>Paper, OCD</td>
<td>16.2</td>
</tr>
<tr>
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<td>5.4</td>
</tr>
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<td>Metal, shop</td>
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</tr>
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<td>Workshop</td>
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**n = 40**

| OCD = O Cho Dua |
|-----------------|-----------|

**n = 37**

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<th>Male %</th>
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<td>35.3</td>
</tr>
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<td>Misc., OCD</td>
<td>23.5</td>
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<td>Bottles, OCD</td>
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<td>Bottles, street</td>
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<td>Paper, shop</td>
<td>17.6</td>
</tr>
<tr>
<td>Metal, shop</td>
<td>10.5</td>
<td>Workshop</td>
<td>11.8</td>
</tr>
<tr>
<td>Bottles, OCD</td>
<td>5.3</td>
<td>Paper, OCD</td>
<td>11.8</td>
</tr>
<tr>
<td>Paper, OCD</td>
<td>5.3</td>
<td>Paper, street</td>
<td>11.8</td>
</tr>
<tr>
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<td>Metal, street</td>
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**n = 38**

**n = 17**
## Table c.7 Volume of materials collected [kg/day]

<table>
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<tr>
<th>Material</th>
<th>Standard deviation</th>
<th>Max.</th>
<th>Median</th>
<th>Min.</th>
<th>Average</th>
<th>Total</th>
<th>Persons in sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mixed waste paper</td>
<td>28.9</td>
<td>200.0</td>
<td>3.0</td>
<td>1.0</td>
<td>8.8</td>
<td>433</td>
<td>49</td>
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<td>White office paper</td>
<td>6.7</td>
<td>10.0</td>
<td>5.3</td>
<td>0.5</td>
<td>5.3</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Carton</td>
<td>1.9</td>
<td>9.0</td>
<td>2.5</td>
<td>0.3</td>
<td>2.9</td>
<td>90</td>
<td>31</td>
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<tr>
<td>Old books</td>
<td>4.1</td>
<td>10.0</td>
<td>3.0</td>
<td>1.7</td>
<td>5.5</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>Newsprint</td>
<td>2.5</td>
<td>6.0</td>
<td>2.0</td>
<td>1.0</td>
<td>3.3</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Plastics</td>
<td></td>
<td></td>
<td></td>
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<td>LDPE bags, dirty</td>
<td>1.3</td>
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<td>1.0</td>
<td>0.2</td>
<td>1.5</td>
<td>76</td>
<td>50</td>
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<tr>
<td>LDPE bags, clean</td>
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<td>1.5</td>
<td>1.0</td>
<td>0.4</td>
<td>1.0</td>
<td>6</td>
<td>6</td>
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<tr>
<td>Other LDPE, PVC, and HDPE</td>
<td>1.5</td>
<td>6.0</td>
<td>1.0</td>
<td>0.2</td>
<td>1.5</td>
<td>64</td>
<td>43</td>
</tr>
<tr>
<td>Polystyrene</td>
<td>1.7</td>
<td>5.0</td>
<td>0.7</td>
<td>0.5</td>
<td>1.5</td>
<td>10</td>
<td>7</td>
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<tr>
<td>Closed cell foam</td>
<td>0.4</td>
<td>1.0</td>
<td>0.5</td>
<td>0.3</td>
<td>0.6</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Scrap metals</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical wire</td>
<td>0.4</td>
<td>2.0</td>
<td>0.2</td>
<td>0.1</td>
<td>0.4</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>Hard aluminum</td>
<td>1.4</td>
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<td>1.0</td>
<td>0.1</td>
<td>1.5</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>Soft aluminum</td>
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<td>1.0</td>
<td>0.3</td>
<td>1.4</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Aluminum cans</td>
<td>0.7</td>
<td>3.3</td>
<td>0.1</td>
<td>0.1</td>
<td>0.4</td>
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<td>32</td>
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<tr>
<td>Scrap iron</td>
<td>31.3</td>
<td>100.0</td>
<td>5.0</td>
<td>0.5</td>
<td>17.4</td>
<td>314</td>
<td>18</td>
</tr>
<tr>
<td>Lead</td>
<td>3.5</td>
<td>10.0</td>
<td>2.0</td>
<td>0.5</td>
<td>2.9</td>
<td>18</td>
<td>6</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broken glass</td>
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<td>10.0</td>
<td>1.5</td>
<td>1.0</td>
<td>2.3</td>
<td>46</td>
<td>20</td>
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<tr>
<td>Bones</td>
<td>3.6</td>
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<td>3.0</td>
<td>1.5</td>
<td>4.3</td>
<td>47</td>
<td>11</td>
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<tr>
<td>Duck feathers, wet</td>
<td>1.1</td>
<td>4.0</td>
<td>1.0</td>
<td>0.2</td>
<td>1.5</td>
<td>28</td>
<td>19</td>
</tr>
<tr>
<td>Duck feathers, dry</td>
<td>0.3</td>
<td>1.0</td>
<td>0.5</td>
<td>0.3</td>
<td>0.6</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Bottles</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquor bottles</td>
<td>4.8</td>
<td>18.0</td>
<td>2.3</td>
<td>0.9</td>
<td>4.7</td>
<td>112</td>
<td>24</td>
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<tr>
<td>Mineral water bottles</td>
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<td>14.0</td>
<td>1.8</td>
<td>0.7</td>
<td>2.7</td>
<td>57</td>
<td>21</td>
</tr>
<tr>
<td>Brown beer bottles</td>
<td>17.6</td>
<td>70.0</td>
<td>7.0</td>
<td>0.7</td>
<td>13.1</td>
<td>235</td>
<td>18</td>
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<tr>
<td>Green beer bottles</td>
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<td>112.5</td>
<td>4.5</td>
<td>0.5</td>
<td>13.2</td>
<td>422</td>
<td>32</td>
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<tr>
<td>Average per person</td>
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<td></td>
<td></td>
<td>31.4</td>
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</table>

### By occupation and gender

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<tr>
<th>Occupation</th>
<th>Kg/day</th>
<th>Persons</th>
<th>MT/day</th>
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<tbody>
<tr>
<td><strong>All scavengers</strong></td>
<td>13.0</td>
<td>1,980</td>
<td>28</td>
</tr>
<tr>
<td>Female</td>
<td>14.0</td>
<td>1,049</td>
<td>15</td>
</tr>
<tr>
<td>Male</td>
<td>13.9</td>
<td>931</td>
<td>13</td>
</tr>
<tr>
<td><strong>Junk buyers</strong></td>
<td>63.5</td>
<td>3,795</td>
<td>240</td>
</tr>
<tr>
<td>Female</td>
<td>57.5</td>
<td>2,467</td>
<td>142</td>
</tr>
<tr>
<td>Male</td>
<td>57.2</td>
<td>1,328</td>
<td>76</td>
</tr>
</tbody>
</table>

### Total materials recovered daily

| **By occupation**     | 5,775  | 268     |
| **By occupation and gender** | 5,775  | 246     |
| **By average per person** | 5,775  | 181     |

LDPE = Low density polyethylene.
PVC = Polyvinyl chloride.
HDPE = High density polyethylene.

Note: Numbers may not total exactly because of rounding.
Table c.8 Reported incomes by occupation, age, and gender (dong/day)

<table>
<thead>
<tr>
<th></th>
<th>All recyclers</th>
<th></th>
<th>Scavengers</th>
<th></th>
<th>Junk buyers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Average</td>
<td>High</td>
<td>Low</td>
<td>Average</td>
<td>High</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2,936</td>
<td>5,314</td>
<td>8,798</td>
<td>2,587</td>
<td>4,935</td>
<td>8,190</td>
</tr>
<tr>
<td>Male</td>
<td>3,046</td>
<td>5,694</td>
<td>8,522</td>
<td>2,903</td>
<td>5,200</td>
<td>7,855</td>
</tr>
<tr>
<td>By age group</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>2,469</td>
<td>4,557</td>
<td>6,654</td>
<td>2,272</td>
<td>4,338</td>
<td>6,317</td>
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<tr>
<td>Female</td>
<td>2,260</td>
<td>4,500</td>
<td>6,650</td>
<td>1,900</td>
<td>4,192</td>
<td>6,385</td>
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<tr>
<td>Male</td>
<td>2,625</td>
<td>4,609</td>
<td>6,658</td>
<td>2,500</td>
<td>4,429</td>
<td>6,265</td>
</tr>
<tr>
<td>20-40</td>
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<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>3,284</td>
<td>6,258</td>
<td>10,351</td>
<td>2,929</td>
<td>6,034</td>
<td>10,407</td>
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<tr>
<td>Female</td>
<td>3,189</td>
<td>5,705</td>
<td>10,300</td>
<td>2,658</td>
<td>5,300</td>
<td>10,000</td>
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<tr>
<td>Male</td>
<td>3,536</td>
<td>7,364</td>
<td>10,471</td>
<td>3,500</td>
<td>7,667</td>
<td>11,375</td>
</tr>
<tr>
<td>&gt; 40</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Total</td>
<td>2,856</td>
<td>4,241</td>
<td>8,587</td>
<td>2,545</td>
<td>4,107</td>
<td>7,929</td>
</tr>
<tr>
<td>Female</td>
<td>2,591</td>
<td>4,167</td>
<td>8,462</td>
<td>2,250</td>
<td>4,438</td>
<td>8,857</td>
</tr>
<tr>
<td>Male</td>
<td>3,271</td>
<td>4,389</td>
<td>8,750</td>
<td>3,375</td>
<td>4,000</td>
<td>7,667</td>
</tr>
</tbody>
</table>

Notes: 10,800 dong = US$1. Italics indicate < 10 cases in subsample.
a. Sample includes 147 cases for which income, occupation, age, and gender data were available.
| Native province | Scavengers | | Junk buyers | | Total |
|-----------------|------------|-------------------|-------------------|-------------------|
|                 | Permanent  | Temporary         | Permanent         | Temporary         |       |
| Outer provinces |            |                   |                   |                   |       |
| Ha Tinh         | 0          | 1                 | 0                 | 0                 | 1     |
| Thanh Hoa       | 0          | 2                 | 0                 | 0                 | 2     |
| Thai Binh       | 1          | 1                 | 1                 | 4                 | 7     |
| Nam Ha          | 6          | 43                | 4                 | 22                | 75    |
| Bordering provinces |            |                   |                   |                   |       |
| Ha Son Binh     | 1          | 1                 | 1                 | 0                 | 3     |
| Hai Hung        | 0          | 2                 | 1                 | 1                 | 4     |
| Ha Tay          | 0          | 2                 | 3                 | 2                 | 7     |
| Ha Bac          | 1          | 4                 | 0                 | 0                 | 5     |
| Suburban Hanoi  |            |                   |                   |                   |       |
| Dong Anh        | 0          | 0                 | 3                 | 0                 | 3     |
| Gia Lam         | 0          | 1                 | 1                 | 0                 | 2     |
| Thanh Tri       | 2          | 0                 | 18                | 0                 | 20    |
| Tu Liem         | 0          | 0                 | 2                 | 0                 | 2     |
| Central Hanoi   |            |                   |                   |                   |       |
| Hanoi           | 14         | 0                 | 1                 | 0                 | 15    |
| Total           | 25         | 57                | 35                | 29                | 146   |
**Table c.10** Reason for working in recovery industry: All scavengers and junk buyers, by native province

<table>
<thead>
<tr>
<th>Province</th>
<th>Second job</th>
<th>Refuge</th>
<th>Vacancy</th>
<th>Main income source</th>
<th>Off-season employment</th>
<th>Total</th>
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<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thanh Hoa</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Ha Son Binh</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Thai Binh</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Nam Ha</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>34</td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>9</td>
<td>38</td>
<td>58</td>
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<tr>
<td>Bordering provinces</td>
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<tr>
<td>Vinh Phu</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Ha Bac</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Hai Hung</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Ha Tay</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Suburban Hanoi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gia Lam</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Tu Liem</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Dong Anh</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Thanh Tri</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>9</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Central Hanoi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hanoi</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Grand total</td>
<td>2</td>
<td>14</td>
<td>6</td>
<td>26</td>
<td>53</td>
<td>101</td>
</tr>
</tbody>
</table>
### Table c.11 Distribution of sample (by occupation and native place)

<table>
<thead>
<tr>
<th>Native place</th>
<th>Scavengers</th>
<th>Junk buyers</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ha Tinh</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0.64</td>
</tr>
<tr>
<td>Vinh Phu</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.64</td>
</tr>
<tr>
<td>Thanh Hoa</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1.28</td>
</tr>
<tr>
<td>Gia Lam</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1.28</td>
</tr>
<tr>
<td>Ha Son Binh</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1.92</td>
</tr>
<tr>
<td>Tu Liem</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>1.92</td>
</tr>
<tr>
<td>Dong Anh</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>1.92</td>
</tr>
<tr>
<td>Hai Hung</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2.56</td>
</tr>
<tr>
<td>Ha Bac</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>3.21</td>
</tr>
<tr>
<td>Thai Binh</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>4.49</td>
</tr>
<tr>
<td>Ha Tay</td>
<td>3</td>
<td>8</td>
<td>11</td>
<td>5.13</td>
</tr>
<tr>
<td>Hanoi</td>
<td>14</td>
<td>2</td>
<td>16</td>
<td>10.26</td>
</tr>
<tr>
<td>Thanh Tri</td>
<td>2</td>
<td>20</td>
<td>22</td>
<td>14.10</td>
</tr>
<tr>
<td>Nam Ha</td>
<td>50</td>
<td>26</td>
<td>76</td>
<td>48.72</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>84</strong></td>
<td><strong>72</strong></td>
<td><strong>156</strong></td>
<td><strong>100.00</strong></td>
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</tbody>
</table>

### Table c.12 Length of stay in Hanoi

<table>
<thead>
<tr>
<th>Length of stay (months)</th>
<th>Arrive</th>
<th>Depart</th>
</tr>
</thead>
<tbody>
<tr>
<td>All temporary migrants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>7</td>
<td>Jul Dec</td>
</tr>
<tr>
<td>Median</td>
<td>3</td>
<td>Jun Sep</td>
</tr>
<tr>
<td>Minimum</td>
<td>1</td>
<td>Jan Aug</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(n = 45) (n = 24) (n = 24)</td>
</tr>
<tr>
<td>Temporary migrants from Nam Ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>5</td>
<td>Jul Dec</td>
</tr>
<tr>
<td>Median</td>
<td>3</td>
<td>Jun Oct</td>
</tr>
<tr>
<td>Minimum</td>
<td>1</td>
<td>May Aug</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(n = 37) (n = 17) (n = 17)</td>
</tr>
</tbody>
</table>
### Table c.13 Location of residence by native province

<table>
<thead>
<tr>
<th>Residence</th>
<th>Native province&lt;sup&gt;a&lt;/sup&gt; (persons)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13</td>
</tr>
<tr>
<td>Bach Mai</td>
<td>1</td>
</tr>
<tr>
<td>Lenin Park</td>
<td>1</td>
</tr>
<tr>
<td>Cau Giay</td>
<td>1</td>
</tr>
<tr>
<td>Gia Lam</td>
<td>1</td>
</tr>
<tr>
<td>Hai Hung</td>
<td>1</td>
</tr>
<tr>
<td>Bat Co</td>
<td>1 1</td>
</tr>
<tr>
<td>Dong Anh</td>
<td>2</td>
</tr>
<tr>
<td>Thanh Nhan</td>
<td>2 1 1</td>
</tr>
<tr>
<td>Tu Liem</td>
<td>4</td>
</tr>
<tr>
<td>Lo Duc</td>
<td>1 1 3 1 2 2 1 1 1</td>
</tr>
<tr>
<td>Van Chuong</td>
<td>1 3 1 2 2 2 1</td>
</tr>
<tr>
<td>Thanh Tri</td>
<td>1 1 1 1 11</td>
</tr>
<tr>
<td>O Cho Dua</td>
<td>4 1 2 1 49 1 1 11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2 2 4 10 3 2 1 4 58 5 2 11 4</td>
</tr>
</tbody>
</table>

Note: See Figure 3.15.

Table c.14 Location and place of residence

Location of residence: Natives of Nam Ha and all other

<table>
<thead>
<tr>
<th>Native place</th>
<th>Total (persons)</th>
<th>Temporary migrants (persons)</th>
<th>Also living in boarding-houses (persons)</th>
<th>Also living in O Cho Dua (persons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nam Ha</td>
<td>42</td>
<td>34</td>
<td>32</td>
<td>28</td>
</tr>
<tr>
<td>All other</td>
<td>39</td>
<td>14</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>81</td>
<td>48</td>
<td>44</td>
<td>31</td>
</tr>
</tbody>
</table>

Place of residence: O Cho Dua and all other

<table>
<thead>
<tr>
<th>Native place</th>
<th>O Cho Dua (persons)</th>
<th>Other (persons)</th>
<th>Total (persons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nam Ha</td>
<td>49</td>
<td>8</td>
<td>57</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>41</td>
<td>52</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>49</td>
<td>109</td>
</tr>
</tbody>
</table>

Place of residence: O Cho Dua and all other, % of total persons

<table>
<thead>
<tr>
<th>Native place</th>
<th>O Cho Dua</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nam Ha</td>
<td>45.0</td>
<td>7.3</td>
<td>52.3</td>
</tr>
<tr>
<td>Other</td>
<td>10.1</td>
<td>37.6</td>
<td>47.7</td>
</tr>
<tr>
<td>Total</td>
<td>55.0</td>
<td>45.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Place of residence: O Cho Dua and all other, % of row

<table>
<thead>
<tr>
<th>Native place</th>
<th>O Cho Dua</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nam Ha</td>
<td>86.0</td>
<td>14.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Other</td>
<td>21.2</td>
<td>78.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>NA</td>
</tr>
</tbody>
</table>

Place of residence: O Cho Dua and all other, % of column

<table>
<thead>
<tr>
<th>Native place</th>
<th>O Cho Dua</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nam Ha</td>
<td>81.7</td>
<td>16.3</td>
<td>NA</td>
</tr>
<tr>
<td>Other</td>
<td>18.3</td>
<td>83.7</td>
<td>NA</td>
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<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>NA</td>
</tr>
</tbody>
</table>

NA = Not applicable.
APPENDIX D

Survey Forms

Buyer Interview Form
(Original in Vietnamese)

Interviewer's name: __________________________ Date __________ / __________ /1992
Name of person interviewed: __________________________
Gender: M / F Age: __________ Origin: __________________________

Type of business:

- mixed waste buyer  sidewalk
- bottle buyer fixed location
- nightsoil buyer O Cho Dua
- metal buyer
- paper buyer
- workshop

Location of business: __________________________

Length of time in business: Years __________ Months __________

How were you introduced to this business?

Why did you enter this business?

Married: Y / N Spouse's origin: __________ Occupation: __________

How does your spouse help you in this business?

How many children do you have?

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Involvement in business</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Buyer Interview Form (cont'd)

Materials:
- mixed wastes
- paper
- carton
- plastic
- scrap metal
- bottles/cans
- nightsoil
- other

Who do you regularly buy (B) from/sell (S) to?
- scavengers at dump B S households B S junkmen B S
- scavengers on street B S workshops B S others B S

Employees:

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age</th>
<th>Duties</th>
<th>Type of payment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>cash by</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>piece day month</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>piece day month</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>piece day month</td>
</tr>
</tbody>
</table>

What is the relationship between you and your employees!

Do any of your friends or family members work for URENCO! Y / N
Who? What? Where?

Do other members of your family buy or sell waste materials! Y / N
Who? What? Where?

What is your opinion about your business, the environment, and the relationship between them!
### Buyer Interview Form (cont’d)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Buying</th>
<th>Selling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>price/kg</td>
<td>kg/day</td>
</tr>
<tr>
<td>feathers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>duck, wet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>duck, dry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mixed waste paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>white office paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>carton</td>
<td></td>
<td></td>
</tr>
<tr>
<td>old books</td>
<td></td>
<td></td>
</tr>
<tr>
<td>newsprint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>plastic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bags: soft, dirty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bags: soft, clean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>soft plastic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hard plastic</td>
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<td></td>
</tr>
<tr>
<td>translucent plastic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rubber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>auto and bike tires</td>
<td></td>
<td></td>
</tr>
<tr>
<td>styrofoam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>packing material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>glass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>broken glass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>clear liquor bottles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mineral water bottles</td>
<td></td>
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</tr>
<tr>
<td>brown beer bottles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>green beer bottles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>metal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>covered copper wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bare copper wire</td>
<td></td>
<td></td>
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<tr>
<td>hard aluminum</td>
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<td></td>
</tr>
<tr>
<td>soft aluminum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aluminum cans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>scrap iron</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lead</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nightsoil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Scavenger Interview Form
(Original in Vietnamese)

Interviewer's name: _____________________________ Date of interview: __/__/1992
Location of meeting: _____________________________ Time: ______________________
Gender: M / F Age: ______ Origin: ____________________________
Type of work: scavenger junk buyer
Equipment:

- hook
- pole & basket
- bicycle
- tongs
- bag
- cargo bike
- basket
- gloves
- boots
- other

Is equipment owned? Y / N or rented? Y / N from whom? ______________________

Source:

- streets
- households
- restaurants
- waste bins
- carts
- workshops
- dumpsites
- hotels/guest houses
- other

Materials:

- mixed wastes
- plastic
- nightsoil
- paper
- scrap metal
- other
- carton
- bottles/cans

Daily routine:

time: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
place: ______________________________________________________________________

Where do you sell:

- mixed waste dealer street shop | O Cho Dua?
- bottle dealer street shop | O Cho Dua?
- paper dealer street shop | O Cho Dua?
- scrap metals dealer street shop | O Cho Dua?
- workshops Y N | O Cho Dua?

Daily cash income: low: ________ high: ________ average: ________
Other income: food: ________ housing: ________ credit: ________
Residence in Hanoi: temporary permanent
If temporary, how long? ________ from ________ to ________
Where do you live (place)? _____________________________ Boardinghouse? Y / N
Do other members of your family buy, sell, or collect waste? Y / N

Do any of your friends or family members work for URENCO? Y / N

Why did you take this job?
### Scavenger Interview Form (cont'd)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Buying</th>
<th>Selling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>price/kg</td>
<td>kg/day</td>
</tr>
<tr>
<td>feathers</td>
<td>duck, wet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>duck, dry</td>
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</tr>
<tr>
<td>paper</td>
<td>mixed waste paper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>white office paper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>carton</td>
<td></td>
</tr>
<tr>
<td></td>
<td>old books</td>
<td></td>
</tr>
<tr>
<td></td>
<td>newsprint</td>
<td></td>
</tr>
<tr>
<td>plastic</td>
<td>bags: soft, dirty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bags: soft, clean</td>
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</tr>
<tr>
<td></td>
<td>soft plastic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hard plastic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>translucent plastic</td>
<td></td>
</tr>
<tr>
<td>rubber</td>
<td>auto and bike tires</td>
<td></td>
</tr>
<tr>
<td>styrofoam</td>
<td>packing material</td>
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</tr>
<tr>
<td>bones</td>
<td>broken glass</td>
<td></td>
</tr>
<tr>
<td>glass</td>
<td>clear liquor bottles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mineral water bottles</td>
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</tr>
<tr>
<td></td>
<td>brown beer bottles</td>
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</tr>
<tr>
<td></td>
<td>green beer bottles</td>
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</tr>
<tr>
<td>metal</td>
<td>covered copper wire</td>
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<td></td>
<td>bare copper wire</td>
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<td></td>
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<td>aluminum cans</td>
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<td></td>
<td>lead</td>
<td></td>
</tr>
<tr>
<td>nightsoil</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. In Cairo, the Coptic Christian Zarrabs collect and recover wastes under contracts negotiated by Muslim Wahis (Haynes and El-Hakim 1979).

3. Baldisimo, Lohani, and Evans (1988) have estimated that workers on each municipal refuse truck in Bangkok shared an additional 4,212 baht ($161) per day from materials collected for sale.

4. In discussions with scavengers and junk buyers in Hanoi, scavengers generally considered themselves above beggars while junk buyers compared themselves favorably to scavengers. For scavengers, the criterion was productive work versus begging. For junk buyers, the criterion was based on association with contaminated wastes.

5. Both between actors and with raw materials.

6. This pattern of organic waste recycling can still be observed in Hanoi. Since the late nineteenth century, when the French colonial authorities instituted wide-ranging sanitation reforms (Masson 1983), human waste has been systematically recycled into suburban agriculture and aquaculture. In its current form, human wastes throughout the city are collected by public and private waste handlers and sold to vegetable and fish-farming cooperatives in the suburbs. Although now stressed by changes in sanitary system preferences and contamination with inorganic or hazardous substances, the system is still functioning and, in fact, developing. New entrants into the market for nightsoil-based fertilizers have introduced methods to compost and dry materials to remove pathogens and ease transport. In addition, by supplementing the natural fertility of nightsoil with urea-based fertilizers, these manufacturers have also been able to increase the immediate availability of nutrients, thus overcoming one of the major drawbacks of organic fertilizers.

7. Ecologically benign in the sense that nutrients are recycled effectively. From a public health standpoint, such nightsoil systems, especially where wastes are not adequately composted, may also contribute to the spread of intestinal and other parasites.

8. Because the authors do not distinguish between scavengers and junk buyers, the term “scavenger” may be taken in its inclusive sense as those who work as collectors within the recovery system.

9. Increasing the amount of waste paper used as inputs in manufacturing paper products is an important means of reducing market demands on remaining natural forests in much of the industrializing world.

10. The term “development” is used sparingly throughout this
paper. The author considers the term as applied to millennia-old civilizations rather audacious. In its place, a more neutral phrase—economic growth and social change—is used.

11. A mode of production consists of a combination of “technical forces of production” and “social relations of production” (Russell 1989).

12. Typologically equivalent to “modern” in neoclassical dualism.

13. Laclau’s criticism (1971) of Frank’s “capitalism everywhere” (via exchange) (1967) gives primacy to relations of production and states four elements of modes of production (MOP): [1] pattern of ownership of the means of production, [2] form of appropriation of surpluses, [3] degree of the division of labor, and [4] level of development of the forces of production. An “economic system” may be composed of many articulating MOP. It is the articulation of the (capitalist and non-capitalist) modes of production that is the framework for understanding Third World development. The MOP concept also linked with Marx’s own attempt to analyze the transition from feudalism to capitalism.

14. Authorities conceded to the presence of street traders in Cali for two reasons. First, street traders and their customers were the political darlings of populist politicians and at each crackdown, rallies were organized to protest the state’s actions. Second, since many larger firms relied on street traders as retail outlets, these larger firms, with greater access to political power, resisted attempts to abolish street trading.

15. Labor unrest among central warehouse employees has been diffused through wage increases. Labor organizers have been customarily pensioned.

16. As a vertically integrated firm, Carton de Colombia was able to draw materials from natural sources (company forest plantations and forest reserves) and recovered materials sources (a hierarchical system of warehouses).

17. Although I do not wish to take on this issue, it must be noted that the use of “self-employed proletarian” as a descriptive term is not as contradictory as it seems. There are many cases of home piecework or other forms of subcontracting in which the worker carries the liability of self-employment while essentially working as a production worker. In this case, Siculic has focused on a very narrow, ideological definition of the terms that ignores actual labor situations.

18. Either through naked enforcement of monopoly or a systematic lowering of prices made possible through a lower cost of reproduction in one sector compared to another (Friedmann 1980).

19. Note that this competitive model reflects nineteenth century evolutionary as well as economic thinking. Kropotkin’s view (1975) of world development history, based on cooperation, like Polanyi’s revival (1944) of reciprocity as a legitimate category of economic analysis, found little support in the spirit of the times.

20. Weber’s use of rationality is strictly a methodological perspective based on means and ends. It is not a value assessment.

21. Scott’s analysis of social relations within the village of Sedaka
provides a particularly salient example of this noncongruence. Landlords, who had ceased to view community support as their base of social power, turned deaf ears to the complaints of former tenants and laborers (Scott 1986).

22. Smith (1988) calls this "fiscal welfare."

23. This was noted in Birkbeck's study (1979) of the paper industry in Cali, Colombia. It has also been noted in models of Japanese industrial development (Itoh 1990).

24. Pronounced "Oh Chur Zur-á."


26. The Nightsoil Collection Unit is an important center of communal relationships within the waste management system. However, because it is beyond the scope of this paper, the organization and operation of the Nightsoil Collection Unit will not be discussed extensively.

27. This estimate is based on interviews with Enterprise Directors in 1992. The official figure for 1991 was 1,232 persons.

28. By 1993, this method had been implemented throughout the urban area.

29. For a description of Tam Hiep, see Case B.6.

30. The recovery industry centered in Trieu Khuc has a long history. Gourou noted that this trade in the early 1930s existed for some time. It began as trade in human hair for export to Europe, where it was used in manufacturing hair nets. While trade in human hair had declined by the early 1930s, trade in feathers, which were sorted and exported from Trieu Khuc, had grown. Feathers, along with broken glass, tin, and bone, were collected by junkwomen who traded candies or small cakes with children who set aside these materials in anticipation of their arrival (Gourou 1955, 620–21). Trieu Khuc remains Hanoi's major suburban center of the recovery industry. Unfortunately, due to time constraints, it was not systematically investigated during this research. Where pertinent, however, comments made by Trieu Khuc residents working as junk buyers and depot operators in Hanoi have been isolated for emphasis.

31. The municipal landfill is about 9 kilometers south of the city limits, near the town of Van Dien.

32. The closure of the dump at Tam Hiep in 1993 has broken this connection. Although residents of Vinh Ninh continue to scavenge at the new site, Me Tri, they cannot easily return to their homes during the day for rest, food, washing, or medical care.

33. In southern Vietnamese, junk buyers are called nguoi vé chai (i.e., bottle people).

34. Hard plastics like plastic jars and old buckets, and soft plastics like sandals.

35. Many depot operators are from Trieu Khuc village.

36. This is accomplished by borrowing from several depot operators and returning to sell to each only enough to cover credit costs. The remaining materials can then be sold without credit attachments to the depot operator to whom working capital has just been returned, or reserved for other depot operators to whom credit is due. In one example of
this procedure, which the author witnessed, a junkwoman, when questioned why she had not returned to sell her goods to this particular depot operator, responded, "I have other obligations."

37. Names cited in case studies are fictitious.

38. The current plan is to expand the ring system by filling canals and ponds between Dai Co Viet and De La Thanh. The new road thus created will run through the "backyards" of many of Hanoi's major dealers and into URENCO's dormitory area. Since this area also contains a number of boardinghouses, ring-road expansion could be disastrous to the O Cho Dua waste trade.

39. The export of scrap metals is illegal. Nevertheless, dealers explain that they are surreptitiously exported through Hai Phong. Smaller boats smuggle scrap metal out to larger boats waiting offshore.

40. When questioned, URENCO administrators admitted that private agreements between scavengers and URENCO staff are common but are not their concern unless they interfere with refuse collection.

41. For comparison, the average monthly wage of industrial workers in 1991 was 76,920 dong ($6.50).

42. See Table C.12.

43. This figure is based on interviews with scavengers and junk buyers living in O Cho Dua ward. Food costs averaged 2,000 dong ($0.19) per day. Housing and incidentals added an additional 500 dong ($0.45) per day.

44. Nam Ha residents comprise 75.6 percent of the temporary migrants working as scavengers and junk buyers within Hanoi (Table C.9).

45. Nam Ha province is composed of what were two separate provinces under French colonial administration, Ha Nam and Nam Dinh, from which the current province derives its name. Members of the Nam Ha recovery community are natives and residents of seven villages—Xuan Hong, Xuan Khu, Xuan Phu, Xuan Thanh, Xuan Thuong, Xuan Tien, and Xuan Truong—in Xuan Thuy district in what was formerly Nam Dinh province.

46. The Dong Anh junk buyers deal in scrap metal. Their major outlet is in Bat Co.

47. The provinces of Ha Tinh, Thanh Hoa, Thai Binh, and Nam Ha share no border with Hanoi municipality.

48. Paddy yields for Nam Ha province range from a low of 3.7 tons per hectare per year to a high of 6.7 tons per hectare per year. Residents of Xuan Hong, a village in Xuan Thuy district, reported that given the best yield, their individual allotments of land (180 square meters) could produce roughly 120 kilograms of paddy per person, or 6.7 tons per hectare. Given these low per capita yields, one could understand why farmers would need cash income to support household expenses (GSO 1992b).

49. Many farmers prefer to pay their taxes in cash rather than in kind. Since taxes are calculated as a percentage of output, valued at harvest, when prices are at their lowest, payment of taxes in cash affords farmers the opportunity to stockpile a larger portion of their
crops for later consumption or possible sale at higher prices later in the year.

50. n = 17

51. During interviews with boardinghouse residents in O Cho Dua, the researchers were told that all planting and most cultivation in Nam Ha province would cease by August 10, the date beyond which it would be impossible for rice to ripen for harvest in November.

52. This subject will be discussed in greater detail in Chapter 4.

53. The term roi rai, used by many of the scavengers and junk buyers interviewed, is used most often to mean “to have leisure time.”

54. Bicycles, used for the transport of materials, are typically carried to Hanoi from home villages.


56. See also Granovetter 1990.

57. Soya curd soup sellers from Nam Dinh are still a familiar sight in Hanoi during summer months. The majority stay in boardinghouses in the Bat Co area of Hanoi’s waterfront.

58. The average income of small landowning households in the delta during the early 1930s was 50 piasters per year in cash or equivalent value. For comparison, during the same period, rice sold for 2 piasters per 100 kilograms and the average annual tax per rural household was 10 piasters (Gourou 1955, 579).

59. An itinerant junkwoman working in Hanoi during the agricultural off-season referred to this as economizing her leisure time.

60. persons per area of cultivated land.

61. Rambo rightly argues against Wolf’s contention (1957) that closed corporate communities have a culture of shared poverty that constrained even the show of wealth. He bases his argument on Gourou’s observation that villagers in the delta strived for household wealth and, having obtained even a minor sum of money, engaged in behavior that could not but attract attention to themselves (Gourou 1936, 288). They constructed homes, purchased positions in the village administration, purchased land, practiced usury, and sent their children to be tutored for the mandarinate examination (Rambo 1973, 36).

62. “The peasant industry of Tonkin is a hand manufacture; it is a tremendous consumer of human labor and its equipment is reduced to a strict minimum: the artisan has no capital and buys only the tools that are absolutely indispensable” (Gourou 1955, 579).

63. These acknowledgments led to an acceptance of the presence of the role of private enterprise within the planned economy and an introduction of what Fforde (1990) calls the “transitional period.”

64. Due to implementation of Council of Ministers Directive 10 (April 1988).

65. Council of Ministers Decree 171.

66. The verb used to describe forced sales, thu mua, is typically used in the recovery industry in the sense of “stockpiling.”

67. Rice tax is negotiated through the cooperative but can range between 20 and 50 percent of the crop. Many farmers prefer to pay the tax in cash because they can
thereby withhold rice from the market during the rice glut, following harvests. By doing so, they are able to retain a larger quantity of rice for later sale or use and pay an equivalent tax based on depressed prices.

68. Unemployment is a concept with little value in societies that make no provision for unemployment relief. Necessity forces most to find work or create work to maintain personal or household subsistence. With no other opportunities available, the potential for small gain against the surety of no gain provides sufficient impetus for most individuals to engage in long hours of low-paying work. Those officially classified as "unemployed" are most often educated youth who are able to wait for employment while living off the incomes of working household members. Thus said, Vietnam's official unemployment rate is between 5 and 6 percent (McCarty 1992; UNIDO 1991).

69. Nonstate is not exactly congruent with private. In Vietnam's economy, nonstate includes local cooperatives, production groups, and district enterprises as well as registered private enterprises.

70. from Ha Tay and Ha Bac provinces.

71. from Nam Dinh.

72. from Thanh Hoa province.

73. This, of course, ignores the fact that both the Task Force and a large public workforce rely on wastes for their livelihood.

74. Workers at Hanoi's composting plant at Cau Dien have been recruited from neighboring farming villages.

75. At the bureaucratic level, this is the current situation in Hanoi.

76. About 85 percent of the Nam Ha population and 31 percent of the population from other provinces.

77. The Vice Chair of the Xuan Thuy People's Committee estimated that, in 1993, 5 percent of the district's population, on average, was engaged in income earning outside the district, principally in Hanoi (Li n.d.).

78. Several of the receivers interviewed during this research considered contracts socialist, while spot markets, which they preferred, were considered capitalist.


80. The director of Environment Enterprise No. 2 in Hoan Kiem district noted that its employees collect a daily average of 25 cubic meters of construction rubble from a section of the Red River dike under their charge. Within O Cho Dua ward, older residents continue to dispose of household waste in local fish ponds under previous assumptions of sustainability. Newer residents of the ward assume that the Hanoi People's Committee will decide to fill these ponds for future residential use.

81. As noted in previous sections, in O Cho Dua ward, at least, exploitative receivers are taxed more heavily than those who engage in more equitable practices.

82. At least one of the receivers operating in O Cho Dua, a former Map Institute employee, stated that her business would not be able to survive if it were forced to relocate to the suburbs.
83. Binnie and Partners (1990), consultants hired to assess the possibilities for centralizing composting in Hanoi, reached similar conclusions based on a comparison of solid waste management in Hanoi and Ho Chi Minh City.

84. The average production of paddy per sào per year is thus 240 kilograms. The average per hectare per year is about 6.7 metric tons.
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