INFORMAL WASTE MANAGEMENT

Shifting the focus from problem to potential

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Abstract. This article discusses the poorly assessed topic of informal waste management systems, in which there appears to be a high level of heterogeneity throughout the world. The article considers the ways scavengers function within the broader context of waste management; they show a wide range of locally formed and adapted activities and social systems. Examples from different cultures are included: the United States, Jamaica, Brazil, Egypt and Indonesia. The authors advocate comparative research and find a contextual, holistic approach to be the most appropriate. Using such an approach, they isolate the important factors that characterize these systems: technical, socio-cultural, socio-political and organizational aspects are elaborated. Experiments in intervention have been undertaken at various levels, from varying ideological and theoretical backgrounds. Academic analyses have ranged from neo-Marxist political economy models to neo-liberal development approaches. As expressed in the title the authors conclude that informal waste management systems are unjustifiably considered problematic whereas they often reveal great development potential.

Key words: informal sector, scavenging, urban sustainable development, waste management

1. Introduction

Imagine a garbage dump in Bandung, Indonesia, a vast expanse of refuse where trucks come and go to unload the rubbish collected in the city during the day. Spontaneous combustion has led to pockets of smoldering waste, making it hazardous to cross the dump. Smoke is everywhere and the stench of garbage is overpowering. Two groups of scavengers, i.e. the men on the trucks, and the women and children waiting for the trucks to be unloaded, are collecting recyclables such as metals, paper and glass to process and sell them to a middleman.

Having done respective anthropological fieldwork that related to situations such as the one above,1 situations of informal waste management, which sometimes goes by the name of scavenging, we came to the conclusion that the existing literature on this fascinating topic was limited in both quantity and scope. Though informal waste management is a reality in perhaps all of the developing world and in many wealthier nations as well, academic work on the topic generally consists of place and time specific case studies. And while certainly there have been a fairly large number of development projects seeking to improve the socio-economic and environmental

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circumstances with regard to informal waste management, those persons with hands-on experience generally do not write scientific analyses of the subject.

Seeking to initiate a more anthropological as well as holistic perspective on scavenging, we combined own fieldwork experiences in respectively Kingston, Jamaica and Bandung, Indonesia with a number of academic case studies as well as instances of development projects.

Analyzing various time and place specific case studies within a comparative framework, we found first of all that all informal waste management or scavenging systems can be characterized by considering four elements, of technical, socio-cultural, organizational and socio-political nature.

Second, we found informal waste management systems to be very dynamic, with a few cases even of literal ‘rags-to-riches’ and with several successful transitions from informal to formal. In other words, both the socially but at times also scientifically espoused view of scavengers and informal waste management systems as problematic and often undesirable, and the notion that those involved in these practices warrant opprobrium are not only morally but also empirically wrong. These individuals, organizations and systems have proven to be capable of great ingenuity and flexibility in unpromising circumstances. This potential of informal waste management is emphasized in this article.

Though the reputation of scavengers is improving in many places, our aim is to stress, without exaggeration, the recognition and appreciation they are due.

Combining these two insights, the analysis seeks to characterize win–win situations in informal waste management: which local combinations of the aforementioned four elements prove to have the greatest empirical potential?

Believing that informal waste management systems should be considered not as problems, but as having potential, we use a holistic vision, comparing case studies to estimate which combination of elements has the largest potential for development. Of course, this does not imply that informal waste management systems are a development goal as such, or that their continuation should be actively promoted. However, as long as poverty and garbage exist in combination, scavenging systems are likely to prevail. Our approach is to accept the reality of these systems and to view them as a basis for further development, instead of an impediment to development, as is still often an implicit or explicit assumption in government and non-governmental organization (NGO) circles.

Before elaborating on the four elements that characterize informal waste management and how these interact to effect varying levels of potential, illustrated with the various case studies, general characteristics of scavenger systems will be reviewed, followed by an indication of academic trends in regarding informal waste management and a brief description of attempts of interventions in these systems.

2. Scavenger systems

Martin Medina (1997) has compiled an overview of common characteristics applicable to scavenger systems. The generalizations he feels can be made are
the following:

- scavenger individuals are relatively poor;
- scavengers have a low ascribed social status;
- scavenger populations often consist of (rural) immigrants;
- scavenging is a typical 'informal sector' activity;
- scavenging can provide economic and environmental benefits;
- besides societal benefits, scavenging can incur social costs;
- scavenging is an adaptive response to chronic poverty in developing countries;
- scavenging supplies raw materials largely to either artisans or industry;
- scavengers recover organic materials to be used as fertilizer for crops or as feed for livestock.

We believe that this list, detailed though it may be, does not represent the great variety of scavenger systems throughout the world. Medina himself states the estimate that up to 2% of the population of developing countries survives through informal waste-recovery activities. This would imply that millions of people are involved in some kind of scavenging. It seems unlikely that such numbers and range of scavengers can be typified in such a list (Medina 1997: 2, 7–12). We support DiGregorio’s (1994: 1) statement that scavenging (whether speaking of the occupation, the labor process, or the industry) has only two common characteristics: ‘a recognition of waste as a resource and a varying degree of social opprobrium’. This ‘definition’ seems more apt than some of Medina’s platitudes. Though the empirical grounds on which his list is based are not unsound, his overview is neither comprehensive nor universal and though we do not advocate a particularistic, merely descriptive approach, we believe that too little academic research has been done to make such broad assumptions.

3. Academic trends

Refuse workers are made up of two categories: those who contribute to the cleaning of the environment by collecting, transporting and disposing of waste, and those who use waste as a resource for the collection of items to be sold for profit. The latter category consists of the scavengers often working informally, and the former are the generally formally employed municipal or community refuse workers. This distinction is more or less theoretical as in practice scavengers also engage in transport, while municipal workers also pursue recycling activities. Sigular (1992) distinguishes the two types in relation to their use of refuse, namely waste-as-waste by refuse officials and waste-as-ore by scavengers. In the Indonesian Bandung setting, these two types of refuse workers were strongly intertwined, as municipal workers functioned as middlemen who bought the ‘ore’ from the scavengers to sell it further to industrial companies.

The labor relations of scavengers were analyzed from a Marxist perspective by Birkbeck (1979) in his study of Cali, Colombia. He described the situation in terms
of self-employed informal sector workers who, like factory laborers, engaged in piecework of which the surplus benefited middlemen. The title of one of Birkbeck's articles expresses this view adequately: 'Self-employed proletarians in an informal factory' (Birkbeck, 1978). The work relations in the solid waste system between scavengers, municipal refuse workers, small middlemen, big middlemen and factories can, however, also be characterized as patron–client relationships based mainly on mutual trust and cemented by rather stable product delivery and money lending patterns. These stable patron–client relations reduce the vulnerability of the scavengers by guaranteeing a certain security of living, albeit at a low standard, as the middlemen use this dependence to fix prices at very low levels. Because of this basic survival strategy, Sigular prefers to describe the scavenger systems in terms of hunting and gathering societies, who survive under conditions of common source exploitation. They gather 'ores' and hunt for 'valuables' in the same way as hunters and gatherers use forests and plains. In Sigular's view the scavengers' exploitation by middlemen occurs through market relations and not by means of employment relations in a capitalist industrial setting.

From this discussion it is clear that scavengers maintain a special system of production relations that differs from that of municipal- or community-employed refuse workers. However, the informal production relations of the scavengers are completely intertwined with formal municipal work. Under the sway of existing perceptions about scavengers, as doing dirty, unhealthy work and being a criminal outcast, the larger society and local authorities generally aim for increased integration and formalization of the solid waste system.

4. Intervention

In attempting to 'solve' problems associated with scavengers and formal or informal systems of solid waste management, various levels of intervention can be discerned. Using own case studies and those found in the literature, the following four levels can be distinguished:

- the level of the factories/industry that produce waste and use salvaged goods as raw materials;
- the level of the middlemen who mediate between the scavengers and industry or others buyers of scavenger materials;
- the levels of the scavengers themselves;
- the level of interventions realized by international institutions or local governments.

With regard to the first level, factories have sometimes taken initiative on their own in promoting (informal) recycling. This can supply them with dual benefits; they gain access to cheaper raw materials as well as obtaining a more environmentally friendly and sometimes socially conscious image. In Jamaica, 'Recycle For Life' is one such industry-sponsored initiative, a group effort of several beverage
companies to reduce litter and recycle polyethylene terephthalate (PET) bottles. The organization pays its partners (schools, churches, NGOs, community-based organizations (CBOs) and others) for collected bottles, transports the bottles to its recycling plant and exports shredded PET. The program has an educational component, gives communities an opportunity to benefit financially, and is presumably not totally unbeneﬁcial to the companies themselves. Though the program is not targeted at scavengers, schoolchildren and church members are encouraged to collect plastic beverage bottles for their own (community) beneﬁt instead of littering, as is quite common in Jamaica (Jaffe, 2001: 65–66). However, after a few years of this program, it has been proved to be ﬁnancially unfeasible and some government and environmental NGO sources have voiced the opinion that it was basically set up by the beverage companies as a scheme in order to preclude government measures regulating packaging.

Intervention at the level of the middlemen occurred in Bandung, Indonesia, where scavengers dominated the solid waste disposal system (Versnel, 1986). There were various categories of workers: cigarette-butt collectors, wet scavengers and scavengers sifting through household waste at different stages in the collection process, namely the cement household containers, the transfer point and the dumpsite. These scavengers complemented the municipal refuse collectors, who transported the refuse from the household bins with handcarts to the transfer points where it was loaded onto trucks heading for the city dump. The scavengers basically applied a recycling system of their own, selecting cardboard, plastic, bottles, tins, repairable items and so on, and cutting and cleaning the materials when appropriate. Modern machines were not used in the waste collection process, with the exception of the municipality’s big trucks. Simple cement bins, hand-pulled wagons, baskets and other instruments were used to hold, transport and work on the collected materials. The scavengers delivered their products to small middlemen who sold them on to industrial companies via bigger traders. The system as a whole can be characterized as traditional and unhygienic, based mainly on manual labor. The intervention, which was initiated by a section of the Technical University of Bandung (ITB), consisted of the creation of scavenger co-operations. The intent was to take over the role of the middlemen and direct the proﬁts from the middle level towards the basis, the scavengers. In point of fact, this was an intervention at both the middle and the lower level. The co-operatives also became active in composting, in order to increase the scavengers’ income. Basically the marketing of compost and the local government’s negative attitude towards scavengers appeared to be the bottlenecks of the Bandung intervention project. Nowadays circumstances in Indonesia have changed greatly, also with regard to the ofﬁcial position on the role of scavengers. However, the Bandung project failed in the end as the co-operatives crumbled and the scavengers worked independently again.

The most common form of intervention takes place at the level of the scavengers themselves. These projects and programs usually have multiple goals and aspects, including the upgrading of scavengers’ living conditions as well as improving their
waste collection/recycling methods or integrating their operations in the formal waste management system.

One example is the establishment of scavenger co-ops in Colombia. Like other South American countries, Colombia has a high level of urbanization and a high level of urban poverty. It is estimated that some 50,000 families make a living from waste picking, mainly at landfills. Traditionally, most benefits went to middlemen, but since the creation of scavenger co-ops this has changed. NGOs and certain governmental agencies have supported and initiated these co-operatives, offering start-up funding and loans as well as technical, managerial, legal and economic consultancy services. When successful, forming co-operatives can lead to scavengers’ independence from middlemen, legal recognition, higher proceeds and better living conditions (Svadlenak-Gomez, 1999: 82–86).

In Belo Horizonte, one of Brazil’s larger cities, some of these objectives were realized following the involvement of a group from the local Roman Catholic Church, the ‘Street Pastoral’. A street scavengers association was formed and the municipal government decided to include it in its new ‘sustainable development’ inspired waste management model. The scavengers were transformed into ‘preferential agents in the collection of recyclables in the city’, receiving operational support as well as educational opportunities. Their working and living conditions improved, while the cleanliness of the city also increased. This relatively small project is an example of win–win strategies within solid waste management, but the success of such projects relies on an open-minded approach and a productive relationship between municipality, CBO or NGO, and scavengers (ASMARE, 1998).

Another example is that of the Egyptian zabbaleen, a group of former rural pig-farmers who have been involved in Cairo’s informal waste management for the last century. After having performed waste collection and resource recovery services in a very traditional manner for decades, they upgraded and mechanized their waste management methods and routes under pressure of government reform and with NGO/World Bank backing. The ‘Zabbaleen Environment and Development’ program consisted of various aspects, including the upgrading of zabbaleen squatter communities, the creation of other income-generating activities, education and the establishment of modernized micro-enterprises. Though the project was not uniformly successful, Svadlenak-Gomez commends it for building on the foundations of an existing waste collection system, while improving it for maximum impact. This was achieved through integrating community development, the use of appropriate technology, and efficient management (Svadlenak-Gomez, 1999: 35–47).

Some interventions are performed at the level of international organizations or local governments, such as in Kuwait, Venezuela and Saudi Arabia. Sicular (1992: 101) lists four types of such international projects, i.e. turnkey projects, customized projects, improvement of an existing system and development agency-assisted projects. In contrast to projects initiated by NGOs or CBOs, these interventions often tend to prefer large-scale, high-tech solutions, which are not always appropriate to the local situation. This is especially the case in turnkey and customized projects. Improvement of an existing system is often a dismissed
option, while projects assisted by development agencies can also be based on local resources, expertise and funding.

In turnkey projects the whole or part of a solid waste management system is delivered by a foreign company. This may include the technical and managerial aspects, and even the recruitment of foreign labor. An example is the Waste Management Inc. Project in Riyadh, Saudi Arabia. These types of projects usually entail huge sums of money and cover periods of 5–10 years. Customized projects also involve a substantial transfer of modern technology and management, but the solid waste management systems involved are completely designed for a particular city. An example is the official Urban Development Project implemented by the Bandung local authorities. Examples of improvement of existing systems can be found in several cities, including Shanghai and Mexico City. They follow an incremental approach warranting more flexibility. Many development agencies, multilateral and bilateral agencies as well as NGOs, are involved in various ways in the improvement of solid waste management systems, usually dealing with the planning phase. Overseeing all these internationally driven systems with Sicular’s assistance one may conclude that the current trends in solid waste management are very diverse – ranging from importing high-tech solutions to assisted local resource development.

It seems that governments are often reluctant to become involved in projects involving scavengers, perhaps due to the lack of much-desired modernity associated with these systems and individuals. Various authors suggest that the role of NGOs and CBOs is crucial in achieving successful interventions as well as sustainable urban management, as these organizations are most likely able to build much-needed alliances, or ‘bridges’, between the (municipal) government, the private waste management sector and the informal sector (Ojeda-Benitez et al., 2002; Baud et al., 2001).

5. Technical aspects of waste management and scavenging

Following the ‘life’ of waste, different techniques and technological innovations can be observed along the way. After waste has been produced, there are basically three stages: collection, transport and disposal, while the sorting of waste in order to extract recyclables can take place at varying points in the process.

Gage (1995) has demonstrated the importance of the method of household containment to solid waste management; the method of storage and pre-collection handling influences the method, speed and efficiency of collection. Especially in lower-income areas, such as in Kingston, the nature of the community (layout or narrow roads) and improper practices at the household level influence collection services. In many cities, a large proportion of the waste management budget goes towards collection.

A tendency seen in many developing countries is to adopt technology from developed countries; this often goes for all stages mentioned above. Thomas speaks of an ‘unquestioning adoption of western systems standards [that] often leads
to unsustainable systems development’ (Thomas, 1999: 366). Modern collection trucks cannot service irregularly laid out neighborhoods without wide, paved roads, such as slums or squatter communities. More ‘old-fashioned’ collection vehicles or a communal garbage collection point on the periphery of a neighborhood would be more appropriate in cases like these. Another drawback in using modern waste technology in developing countries is that the composition of waste differs. Refuse in poorer countries usually has a much higher proportion of organic matter, and is denser and moister than ‘rich’ garbage. These differences have consequences for the applied technology and management of solid waste systems, with the result that highly sophisticated solutions are unsuitable.

Transportation of waste or scavenged materials relates to collection methods in that modern equipment, such as trucks, is often inappropriate to local circumstances. On the other hand, manually pushed or animal-drawn transportation has a limited range. This means that informal waste collectors often dump their loads illegally, as the distance to official waste disposal sites is prohibitive. A potential solution is the establishment of transfer and storage sites, where waste can be stored until it is taken to its final destination. These sites can also function as a location for (further) resource recovery activities.

When it comes to waste disposal, there are essentially three options: landfilling, incineration and recycling. Some authors list export of waste as an option, but ethically and financially (especially for developing countries) this is not really a viable alternative. Landfilling is essentially the cheapest way of getting rid of a city or country’s garbage, but becomes problematic in times of land shortage. Besides, if the waste disposal site is an open dump – which is much less expensive than a sanitary landfill – this can have considerable consequences for both the environment and public health.

Incineration is rarely a real option for developing countries. Incineration plants are very expensive, can be a source of hazardous emissions, and are usually not suited to ‘poor’ garbage. Because of its high organic content and moisture level, this garbage is not susceptible to spontaneous combustion and extra fuel must be added, raising the costs even more.

Recycling is generally the most environmentally consciousness and cost-effective method of waste disposal. Although various forms of sorting, composting and recycling take place at the household level, these are often individual, non-coordinated efforts. Governments may try to implement pre-collection sorting schemes with various levels of success, and obviously this has great potential, in that costs are shifted from the public sector to the household sector, making use of existing ‘environmental social capital’ (cf. Figueroa, 1998). One fairly successful example is on the Caribbean island of Curaçao, where the semi-privatized waste management company effected the introduction of bottle banks. However, large-scale formal recycling schemes require a high level of public participation, one that is not always present or possible in the context of developing countries. Informal recycling activities and technologies are often more suited to the local situation than formal schemes implemented from above.
The sorting of waste for recyclables, which takes place at various points in the waste management process, is an activity that—without the voluntary pre-collection household sorting or expensive machinery found in wealthier countries—is most efficient when carried out manually.

Collection methods and post-resource recovery use of waste by informal actors (such as scavengers) are often well adapted to the physical situation, as well as to local supply-and-demand economics.

Informal methods and techniques in waste management are generally labor intensive; formal methods tend to be labor-saving, but capital-intensive. Developing countries often have a surplus of (cheap) labor, but are short of capital; integration of informal technology instead of adopting unsuitable and expensive foreign technology can be a step towards more cost-effective and sustainable waste management.

6. Socio-cultural aspects

In many, though certainly not all, developing countries, scavengers have a different socio-cultural background than the majority of the population. It can be stated that their socio-economic status is usually very low; the general population as well as the authorities often view and treat them as ‘part of the rubbish they work with’ (ASMARE, 1998). A UNESCO report shows that this attitude has even been adopted by scavengers themselves. ‘Comparative research and experiences have shown that the scavengers consider themselves as a sort of social category associated with “sub-human characteristics”’. Low education levels and unhealthy working conditions in combination with their popular status lead to a negative self-perception and a lack of self-confidence (UNESCO, 2001).

Medina states that ‘even though scavengers are not always the poorest of the poor, their occupation is generally ascribed the lowest status in society. Historically, outcasts and marginal groups, such as slaves, gypsies and migrants have performed waste collection and recycling activities in developing countries...And in Muslim countries, non-Muslims usually perform refuse collection and recycling activities since contact with waste materials is considered impure’ (Medina, 2000).

In India, scavengers are often Dalits, or ‘untouchables’, not simply the lowest in the caste system but essentially outside it. Because of their caste, they are seen as being the lowest of the low, relegated to dirty work such as scavenging. The daily contact with garbage and sometimes even human excreta reinforces their ‘untouchable’ status. In other countries, such as Egypt, scavenger communities are groups of rural migrants who adopt scavenging as a way to survive in the city and end up specializing in this sector. In many countries, gypsies were the ethnic group involved in scavenging activities (cf. Fonseca, 1994). And in the case of San Francisco, described below, the ‘informal recyclers’ were mainly of Italian–American background.
Aside from the day-to-day bad treatment that waste pickers experience, their low status can deter them from climbing the social ladder. NGOs and sometimes even governments strive for recognition of scavengers’ humanity and value.

One way of tackling the ascribed as well as self-replicated low status of scavengers, whether or not related to ethnicity, is through the creation of co-operatives. Besides raising income, this form of grassroots development potentially can give scavengers a certain status; they are recognized as an accepted part of the waste management system that is beneficial to the whole population and their self-esteem grows with self-reliance. After all, ‘small businessmen’ and ‘micro-enterprises’ sound more modern and hygienic than ‘rag pickers’ or ‘vultures’.

7. Organization

In formal and informal waste management systems one can find a great variety of organizational forms. The following list of instances found in the literature as well as in own research gives an example of the diversity: individual scavengers, informal scavenger systems, semi-formal waste-recovery companies, co-operative organizations of scavengers, municipal waste collection organizations tied to CBOs and formal municipal waste collection companies.

In trying to classify this heterogeneity, one finds a series of contrasting aspects; the organizational forms range from formal to informal; small- to large-scale; private to public; individual to co-operative; and assisted to non-assisted (with or without external NGO or governmental facilitation). The scope of organization can range from the local urban level to a regional, national or international level. Of course the organizational forms do not always conform to one or the other extreme but often assume gradual or mixed forms.

A good example of how an informal waste management system evolved into a highly organized and profitable business is found in Stewart E. Perry’s (1978) elaborate study of San Francisco scavengers. The solid waste management system developed from fierce competition between individuals, who picked up refuse in the early days with a wagon and horse, to a co-operative with equal partners under the name ‘Sunset’ which later turned into the conglomerate ‘Envirocal Inc’. Using participant observation in the 1960s and 1970s, Perry gives a lively account of the views of the mainly Italian-American scavengers on their work, their company and the clients they had to deal with. The scavengers were mainly poor immigrants of Italian origin. After the period of aggressive competition they formed a co-operative. The partners who worked in the company purchased a share in the co-operative, which could be sold later and increased in price in the course of time. All partners received the same salary. Besides the partners themselves the collection of waste was done by helpers who did not own a share. The sons of the partners often followed their fathers as a helper, which explains the family and ethnic feelings of the workers in the co-operative. The waste laborers liked the work in the open air which to a certain extent was also quite adventurous, spiced up with regular
incidents, especially in the early morning when they started collecting the waste in their containers, carried on the back to the truck and in later years to the compactor. The work was heavy and often dangerous. The low status of the workers often made the relationship with the clients troublesome. It was characterized by the avoidance of eye contact. Especially the afternoon round that had to be made to collect the money for the service rendered, which involved direct contact with the clients, was experienced as difficult, particularly after the long morning hours of carrying the heavy wastebaskets. This money-collection round was done only by the partners, as the helpers were not allowed to be involved. After the introduction of IBM machines the bills were sent to the homes of the clients and the collection of the money at the door was gradually stopped. The management also changed. Office work became more important. The leadership, who received the same salary as all the other partners, introduced differences in payment depending on the levels of tasks of the workers. The company, moreover, increased its scale considerably, keeping pace with urban expansion, particularly suburbanization, and also began to diversify its activities. Solid waste collection was more and more perceived as part of environmental policy. The lack of a landfill site was not just a problem for the scavenging company, but became a hot item for the municipal government in the local political arena. The modernization of the company, which included a huge transfer station to transport waste to a new landfill area, also led to a change of the organizational structure into that of a holding company. Each partner exchanged his share in the ‘Sunset’ co-operative for shares of stock in the new ‘Environal’ holding company. The four general factors mentioned, namely management, technology, culture and context appear to be prominent in the development process of the scavenger community in San Francisco. They are intertwined in a complex way: not just the one determining the development of the other, but all evolving in their own ways and at the same time influencing the others.

8. Socio-political context

The relationship between scavengers or scavenging systems and the authorities varies markedly from country to country. We find Medina’s categorization of the main responses to be apposite. He sees four categories, namely: (1) repression; (2) neglect; (3) collusion; and (4) stimulation. In many developing countries, the government sees scavenging – whether on the streets, at dumpsites or elsewhere – as a sign of failure to modernize and as an undesirable phenomenon. This attitude can lead to harassment and physical aggression towards scavenger communities though to our knowledge this has never led to ‘solving the problem’. Neglect occurs when a government views neither the benefits nor the hazards associated with scavenging as a priority. Collusion is found in situations resembling clientelist systems, with hierarchy ‘tying’ lower-level informal actors to higher-level formal government ones (Medina, 1997). In some countries, such as Jamaica or Indonesia the authorities promote a more progressive policy, trying to find safer and more
equitable win–win situations rather than trying either to exploit or to abolish the community and its activities. Indonesia’s former president, Soeharto, spoke out publicly, urging for appreciation of scavengers’ contribution to the environment and the economy (UNEP, 2001).

Kingston, Jamaica, is another example of a Third World city coping with solid waste management issues. As in other countries, one of the main problems is that the amount of waste being produced exceeds the municipality’s capacity to process it. Collection, transport and disposal services are underfunded and suffer from a lack of managerial and technological expertise. At the present, the government is engaged in a program to restructure the whole waste management system through organizational, legislative, regulatory and technological reform. Another goal is implementing waste reduction strategies; this will be achieved in part through public education and awareness-raising campaigns. Till now, these campaigns have not proven very successful in changing people’s behavior regarding waste management. An additional strategy in reducing the amount of waste that has to be disposed of is focusing on recycling and resource recovery. However, at present Jamaica has very few public or private formal recycling activities. One of the main forms of resource recovery and recycling is scavenging.

Scavenging in Kingston occurs primarily at the city’s main waste disposal site, Riverton City. This dumpsite, which is currently being transformed into a sanitary landfill, is located on the periphery of the city. It covers an area of 12 ha, and is the designated destination of Kingston Metropolitan Area (KMA) residential, commercial and industrial waste. Approximately 500 tons of waste are dumped at the site daily. The garbage contains enough valuable resources to provide a livelihood to hundreds of scavengers. Many of them live around the dump, in the Riverton City community, but some travel to their place of work each day by bus, as they would to a job.

After the municipal and private dump trucks have tipped their loads in different cells on the dumpsite, the scavengers sort through the new refuse manually, collecting all items that could be of value. Main items of value are scrap metal, glass bottles and clothing. As in many other countries (cf. Adeyemi et al., 2001), most of the scavengers at the site are male, but apparently small children roam the dump too. Though the main significance of waste for the scavengers is its economic value, other factors play a part too. The health consequences of working and living on and near the dump are considerable. People have been injured in accidents with trash compactors and other machinery, and stories are known of people becoming seriously ill or crippled after contact with medical waste, as KMA has no special facilities for medical or hazardous waste. Besides being exposed to health risks, the socio-economic status of scavengers is very low. They feel that they are seen as animals; because they work amidst trash, people regard them as trash themselves.

Actually, many scavenger systems, including this one in Kingston, are highly developed social systems. They effect a resource recovery system that is flexible, efficient and thorough; they constitute an organized, yet informal work force. Unlike in several other developing countries, the Jamaican government accepts the reality
of scavenging and, instead of ignoring or harassing scavengers, seeks to integrate them into the formal waste management scheme, choosing for a stimulation strategy. The Riverton City scavengers are included in the national solid waste management reorganization scheme, as the government tries to pursue economic and health security for those working in 'community-based recycling activities', while promoting a certain level of environmentalism at the same time (Figure 1).

9. Conclusion: a model

On the whole, research done on scavenging and informal waste management systems is very limited, with only a scattering of true fieldwork done throughout the world, mainly in Indonesia, Egypt, Colombia, the Philippines and Brazil. One reason for the scarcity of the research data and grounded insights on scavengers is that this subject has only quite recently become an academic focus. Another reason is that it is difficult and sometimes dangerous to perform research in these often shunned communities. However, the research that has been done has had as a main effect that it put scavengers on the political agenda. To be able to form more empirically established ‘dynamic models’, we advocate research to expand and to work without inflexible or outdated paradigms and focus on the interaction of contextual conditions.

As demonstrated above, there is great variety in scavenging and waste management systems, in socio-cultural, technological, organizational and socio-political aspects. This variety extends to scientific analyses of (informal) waste management systems and forms of interventions in these systems. It is injudicious to view
scavengers or scavenging as separate from waste management as a whole, as it is to try to compile a standard list of generalizations. Neither the neo-Marxist ‘political economy models’ of the likes of Birkbeck nor neo-liberal development approaches will succeed in the forming of foolproof universal models for such a wide range of locally formed and adapted activities and social systems. These are ‘specifically contextualized forms of organization that require dynamic, contextualized, and holistic modeling’ (DiGregorio, 1994: 23).

From using a historical and comparative perspective, what became obvious was the interplay of four important factors, namely the use and appropriateness of technology in scavenging systems, the socio-cultural background of the scavengers, managerial developments, and the local and general socio-political context as illustrated in Table I.

Table I is a hypothetical model of the interaction of the different characteristics in informal waste management; A–D represent different hypothetical cases. Due to the dearth of academic case studies it was not possible to construct a completely grounded model. However, based on the case studies that were available it is clear that four aspects combine to result in various success levels. The level of organization ranges from low to high; the socio-political context can be one of repression, neglect, collusion or support; socio-cultural differentiation can be restricted to social status or extend to ethnicity; and the technical context can comprise a situation where modern technology (methods and technology used in collection, transport, sorting and disposal of waste) is either appropriate or inappropriate. Apart from these four factors, the type of intervention will also be relevant in determining the level of success a scavenger system has in integrating into the formal system. In some situations, a government intervention may be the most advantageous while in others an NGO or CBO may be in a better position to make a change.

It would seem that scavenger systems with a high level of organization, or the prospect of such an order (conditions conducive to the formation of co-operatives), have a higher likelihood of integrating in or becoming part of formal waste management, especially if the socio-political context is one of stimulation, though situations of collusion or neglect need not always form a great obstacle. Repression, certainly if combined with a low level of organization, is more likely to lead to exploitation in unsafe and unhealthy circumstances.

The potential success of a system does not seem to be directly linked to whether scavengers are of a different ethnic background than the majority, or whether the socio-cultural differentiation is restricted to low status. Levels of organization are sometimes but not always higher amongst a distinct ethnic group (as in San Francisco), but governments may be more likely to adopt a stimulation policy if those involved in informal recycling activities are of the dominant ethnic group.

Finally, their flexibility and the fact that informal waste management systems are well-adapted to the local situation works to the best advantage in these systems in situations where modern, expensive systems and technology are inappropriate.
<table>
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<th>Case model</th>
<th>Organization</th>
<th>Socio-political context</th>
<th>Socio-cultural differentiation</th>
<th>Advanced technology</th>
<th>Success factor</th>
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We hope that more case studies as well as comparative research will be conducted on informal waste management, a topic that is fascinating as well as very relevant to sustainable urban development. This could validate or expand a contextualized model as presented above. Furthermore, in developing countries, informal waste management systems and those functioning within them are still regularly viewed as impediments to modernity that are to be eradicated, not developed. It is conceivable that additional scientific research can, through focusing attention, have the further benefit of influencing government attitudes so that scavengers are shown a degree of respect, not contempt. Moreover, the accumulation of information and scientific knowledge can help NGOs working in this field transcend the local context in order to gain better insights and to recognize opportunities, so that ultimately improvements in the living and working conditions of scavengers can be achieved.

Notes

1 Peter J.M. Nas was involved in a project on scavengers in Bandung, Indonesia in the 1980s and Rivke Jaffe conducted fieldwork on solid waste management in Kingston, Jamaica in 2000 and is currently involved in research on urban environmental problems in Kingston as well as in Willemstad, Curacao.

References


