



Marketing of Waste Management Services in South Countries

Affordability and willingness to pay

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CHAPTER 1 INTRODUCTION

Most municipalities in developing countries spend a large proportion of their budgets on the collection, transport and disposal of solid wastes. Their solid waste management is a costly service that consumes between 20 and 50 percent of available operational budgets for municipal services, yet serves no more than 70 percent of the urban inhabitants (Bartone and Bernstein, 1993). The unserved are almost always the growing low-income populations concentrated in the periurban areas. Keeping pace with the requirements of rapid urbanisation and continuing population growth, and because of its critical role in protecting the environment and public health, accomplishing effective municipal solid waste management should be a priority for Third World cities.

Most attempts to improve solid waste management in cities have focused on the technical aspects of different means of collection and disposal (WB, 1992). Recently, more attention has been paid to enhancing institutional arrangements for service delivery, with a special emphasis on privatization methods (Cointreau, 1994). Also an abundant number of articles focused on the demand-side of water and sanitation can be found (Whittington *et al*, 1990; Whittington *et al*, 1991; Whittington *et al*, 1993; Altaf and Hughes, 1994). However, much less effort has been directed at investigating the demand-side related to solid waste management.

CHAPTER 2 OBJECTIVES

An improvement of municipal solid waste management in the underdeveloped urban areas in Third World countries is important. To emphasize this importance a research is being implemented which has as its main research objective *the identification or development of a marketing method for solid waste management services to households in urban peripheries of South countries*. The target group for using the method are those who develop and design waste management services, amongst others governmental planning agencies and development projects. A second research objective is subsequently *to test the feasibility of the method in a case study in a South country*¹. In order to specify the research objective in more detail, several clarifications in the form of definitions will be reviewed. This enables us to understand the theoretical jargon and by doing so it elucidates the search for a viable marketing method. Moreover, the key research questions will become more evident. They can be described as follows:

1. What kind of alternatives, or sets of alternatives in the delivery of waste management services can be discovered?
2. How will the willingness-to-pay for municipal solid waste services be assessed?
3. How will the affordability-to-pay for solid waste services be measured?
4. How can the assessment of the demand for existing and new, improved solid waste services take place?

2.1 Solid waste management services

Solid waste management services is referred to as a) the collection and transportation of domestic solid waste, b) the disposal and treatment of domestic solid waste, and c) the reuse and recycling of household solid waste. This definition is of importance for it precludes the assignment to investigate the marketing of industrial, institutional, and commercial solid waste management. Although it must be acknowledged that the separation of household solid waste and industrial, institutional, and commercial sector waste (*e.g.* hospital refuse) in real life is difficult in developing countries, the main focus lies with domestic refuse.

2.2 Households

What is meant by households in underdeveloped urban areas in developing countries? Common sense tells that merely general definitions, supported by economic and social statistics when it comes to define low, middle and high income households, can be given. Perhaps a general and clear term of household is "a group of persons generally bound by ties of kinship who live together under a single roof and who share a community of life [...] and a common source of food" (Casley and Kumar, 1988). Clearly though, each country, each city, and each urban area claims its specific characteristics².

¹ The description of this case-study, its corresponding data presentation and conclusions are set out in the UWEP working document WD 13 and is refrained from mentioning in this document.

² See M.P. Todaro "Economic Development in the Third World", Longman Publishing, 1992, for an elaborate analysis of poverty income distribution, and urbanization

2.3 Municipal solid waste

How is municipal solid waste described in this research? Municipal solid waste can be classified in several types of waste with the process of waste generation as the indicator of classification. Industrial, institutional, commercial sector, and household waste are examples of such a classification. As noted above, in this research solid waste will be narrowed to household solid waste which in its turn consists of a large number of different elements such as food and garden waste, paper, plastic, cardboard, glass, metal, clothes etc. that have no value to the household members discarding it. Subsequently, in prosperous urban areas, solid waste normally covers more inorganic materials. In low-income neighbourhoods, the existence of small workshops and local markets leads to more organic and industrial waste also being added to household waste (Van der Meulen, 1996).

2.4 Commercial marketing versus social marketing

Commercial marketing and social marketing of waste management services to customers have to be described. The commercial marketing of municipal solid waste management (MSWM) is the analysis, planning, implementation and control of programs or projects designed to create, build and maintain sustainable municipal solid waste services for the purpose of achieving economic objectives (Kotler, 1983).

Social marketing, on the other hand, refers to a strategy of changing human behaviour in the sense that old habits must be overcome, and that new ones have to be learnt and maintained (Kotler and Roberto, 1991; Ikin, 1994). In short, it is a management technique which is aimed at increasing the acceptance of a vast number of new values, attitudes or perceptions on the subject of solid waste services by one or more groups in society. One can simply state that social marketing is a series of promotions designed to influence social behaviour and that it adopts techniques from normal marketing in the field of research, targeting, positioning, message design, testing etc., with the objective to sustainably ameliorate the consumer's perceptions, attitudes, and opportunities towards the solid waste problem. The commercial marketing's objective, however, is not to change the attitude of households (or individuals) in generating refuse, in trying to persuade them to pay periodically, or putting emphasis on the augmentation of recycled waste for example, how desirable it may be, but to market an effective and efficient solid waste service given the conditions in urban areas.³

On the whole, the most distinguishing characteristic between the two types of marketing is the difference in motivation. Commercial marketing is primarily motivated by profit whereas social marketing is aimed at promoting social services, ideas or concepts. Unlike commercial marketers, social marketers often target their campaign at the poorest segment of society. In fact, social marketers and commercial marketers are sometimes adversaries. Social campaigns now and then involve counter-marketing or prevention campaigns that directly oppose commercial marketing,

³

In stead of using the normal term marketing, we can also use the term "societal marketing" which holds that the organisation's task is to determine the needs, wants, and interests of target markets and to deliver the desired satisfactions more effectively and efficiently than competitors in a way that preserves or enhances the consumer's and the society's well-being (Kotler, 1983). The only difference is that societal marketing recognizes the long-run importance of satisfying consumer wants in relation to society's well-being. This minor discrepancy enables us to keep using the term marketing.

as smoking prevention campaigns clearly demonstrate. To summarize, the differences between commercial and social marketing are depicted in the box below.

Box 1. Differences between commercial marketing and social marketing

Commercial marketing	Social marketing
products are often immediately satisfying	products are less immediately satisfying
products have clear and strong identities	products are attached to complex, abstract values and perceptions
motivated by profit	motivated by societal gains
selling positive purchasing action	sometimes involves avoidance behaviour
aimed at people with purchasing power	frequently aimed at the poorest or least-educated groups in society
creating demand	uncovering unfulfilled demand

However, social marketing may become of vital importance when products like ideas, behaviour or real products with the intention of changing one's behaviour, are being marketed. These products are being referred to as "social products". With the provision of solid waste services, a target objective might be to change the existing attitude and behaviour of households in urban areas in order to successfully implement a marketing strategy for solid waste services. The social marketing plan thus forms an aspect in the integral marketing strategy and changing the behaviour of the participants becomes a central objective. The prerequisite of its success is either to create a new social product to meet the needs of households, currently not being satisfied, or to design a better product, which is already being supplied to households.

2.5 Sub-objectives

With these descriptions in mind, the main objective of this research becomes less indistinct. Consequently the derivation of sub-objectives directly related to the marketing of MSWM becomes more evident. For the development of a marketing method to be successful, the following research questions need to be considered carefully.

What kind of alternatives, or sets of alternatives in the delivery of waste management services can be discovered?

In a service oriented approach the solid waste management system can be divided into two subsystems: a primary and a secondary system. The primary system comprises the collection of waste from households at the neighbourhood level. The secondary system is the transportation to, and the disposal and treatment at the final disposal site. To identify a set of alternatives in the delivery of waste services, this research will try to derive from the European markets, especially

the Dutch market, a solid base for translating concepts into a feasible method for marketing solid waste services in urban peripheries in developing countries.

How will the willingness-to-pay and affordability-to-pay for solid waste services be measured?

This price-oriented approach will perhaps be the most essential element in the marketing of municipal waste service. From a financial point of view, if urban waste management projects are to be both sustainable and replicable, an improved planning methodology is required that includes a procedure for eliciting information on the value placed on different levels of service, and tariffs must be designed so that at least operation and maintenance costs, and (preferably) capital costs, can be recovered. A key concept in such a methodology is that of "willingness-to-pay". If people are willing to pay for the full costs of a particular service, then it is a clear indication that the service is valued and therefore will most likely be used and maintained. Hence it will be possible to generate the funds required to sustain the service^{4***}. Nevertheless, it is widely assumed that in many cities in developing countries these waste services are not effectively and not efficiently rendered. Therefore it is vital that research is being done on the affordability and willingness to pay for waste services. In this paper several methods will be reviewed on how to assess both social aspects.

How can the assessment of the demand for services take place?

This preference-oriented approach is needed to obtain a sense of the relative priority of, albeit improved, waste management services with regard to other services, for instance, improved water services or better sanitation performances. This comparison is fundamental because from recent study it becomes clear that households consider solid waste services as a normal economic good with its consequences for household welfare (Altaf and Deshazo, 1996). In order to come forward with methods to measure the demand for waste services for households, some ideas will be discussed here.

Before this discussion can take place, however, there is a need to clarify the economic rationale of the problems associated with the good "solid waste service". Waste management services can be regarded as completely public goods. Nonetheless, there are arguments in favour of the idea that solid waste collection can be treated like a private good. This will be explained further on. Being a public good, solid waste management service is confronted with the free rider problem. The free rider problem is referred to as the reluctance of individuals to voluntarily contribute to the support of public goods, here, solid waste services (Stiglitz, 1989). This problem will directly or indirectly be present during the whole implementation of the research. It is therefore significant to summarize the economic theory of public goods in short.

⁴ Most attempts to incorporate willingness-to-pay considerations into project design, however, have been ad hoc, in large part because of the absence of validated, field-tested methodologies for assessing willingness to pay for particularly water in the context of rural communities in developing countries (Whittington *et al.*, 1990).

CHAPTER 3 A SUMMARY OF ECONOMIC THEORY: THE PROBLEM WITH THE MARKET OF SOLID WASTE SERVICES

Solid waste management is a service for which the local government is responsible. To define public goods, two critical properties come forward (Stiglitz, 1989). First of all public goods are nonexclusive, meaning that once the service is provided to some proportion of the community it benefits the overall public welfare, not only the resident that specifically receives the service. In other words, it is not feasible to exclude others from enjoying the benefits of the provided service. Secondly, public goods are considered non-rivalled, meaning that any resident can enjoy the profits of the service without diminishing the benefit to anyone else. Furthermore Cointreau (1994) adds another characteristic to the description of public goods, in particular the provision of solid waste services, being essential to public health and environmental protection. These qualities of being non-exclusive, non-rivalled essentially place responsibility for solid waste management squarely within the public domain. Private goods, in contrast, can be described as goods individually consumed, which are being denied by the producer until payment has occurred. In short, private goods are exclusive, rivalled goods and, to a certain extent, nonessential to the level of public welfare. As has been indicated, the service provision of solid waste discarded is a pure public good where the level of government responsible is typically local or metropolitan. Subsequently, one has to take into account that it does not necessarily mean that the local government has to accomplish the task of solid waste service delivery entirely on its own. Several options of private sector participation most common to solid waste management is profoundly analysed by Cointreau (1994).

3.1 The economics

For economists it is straightforward to pinpoint all kinds of subjects into an economic terminology and preferably visualised in mathematics or graphs. Consider the demand curve for domestic solid waste services shown in figure 1. The fee the household pays for refuse collection must cover the cost of transporting and disposing of the waste generated, as well as collecting it. Henceforth it is wise to denominate refuse collection as the household's demand for solid waste services. As with virtually any demand curve now, as price declines, demand for the good increases. Assume that in the case of solid waste services, the price per unit waste discarded in many communities is zero, *i.e.* the marginal private cost of an additional person enjoying them is zero. Then, the quantity of such waste services demanded, measured as the quantity of waste refused, corresponds with Q_z . It is important to note that this quantity of Q_z is more than the quantity that would be demanded if the going price for solid waste service were positive. In figure 1, if a positive price were charged per unit of solid waste service, say P^* , the quantity of waste services would decline to Q^* .

For the quantity of waste not only to decline but also to be optimal, the price charged for these services by governmental organisations or private enterprises should reflect the social cost of such services. Social cost is defined as the sum of the private and public costs of solid waste services. An example of a private cost is the cost induced by transporting waste to different locations. Public costs take the form of costs related to the prevention of environmental impact of solid waste services, like the costs to reduce ground water contamination or the costs to avoid

waste dumping close to urban areas, and the costs related to reduce public health impact. To reduce waste to its optimal level, the price for waste services should equal the social cost of waste services. Put it differently, the price should reflect the marginal social costs of solid waste services. In figure 1 it is assumed that the marginal social cost is P^* and therefore the optimal quantity of solid waste service will be Q^* .

Demand curve for household solid waste services

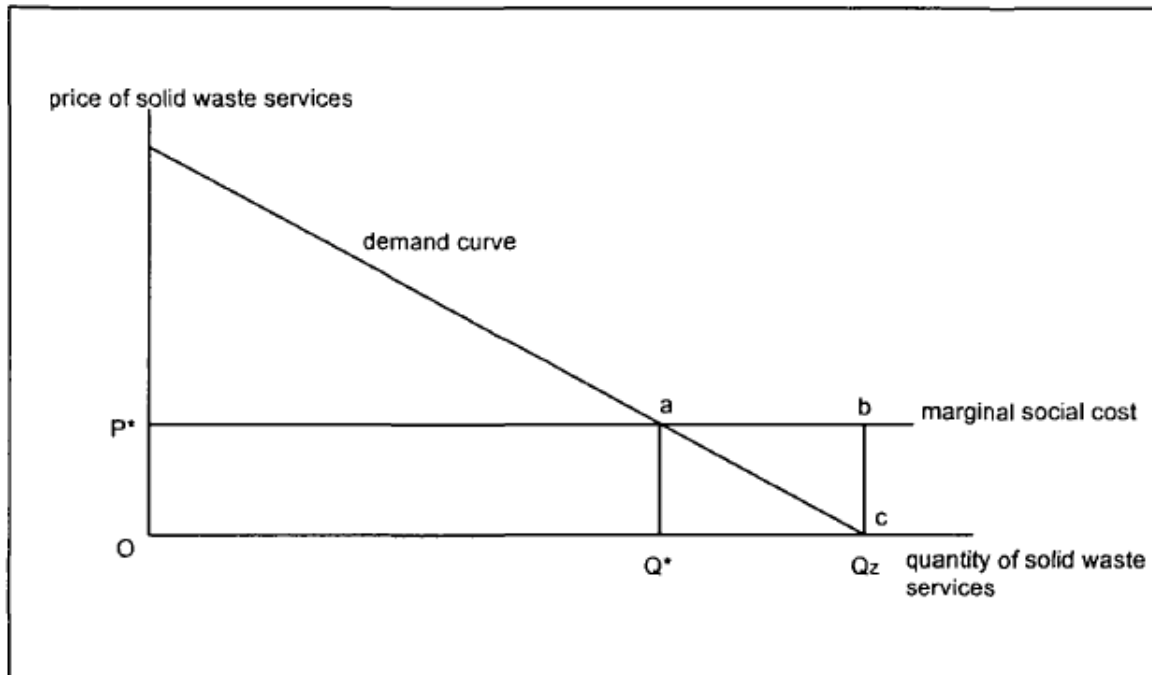


figure 1.

Consider the quantity of waste discarded in figure 1 beyond the optimal quantity - from Q^* to Q_z . The cost to society of disposing of such waste is greater than the benefit to households of having it discarded. The benefit to households of receiving these services is represented by the demand curve itself. The reason is that if a household is willing to pay a certain amount of currency value to receive a service, then it must be true that the service benefits the household by that value. The disparity of $Q_z - Q^*$ leads to a welfare loss to society equal to the area of the triangle abc. Summarized, the provision of solid waste services at prices below the marginal social cost, leads households to over consumption it and also to a welfare loss because the marginal social costs are positive. The market for waste services, however, is not a special one. Any good whose price is zero is likely to be over-consumed to a point where society suffers a welfare loss.

However, theoretically speaking, when the demand curve for solid waste services is nearly vertical the welfare loss will be minimal. This depends entirely on the responsiveness of the households to a user charge for waste services. A user charge can be explained as a fee imposed on the waste discarded, based on the weight or volume. In more simple terms, a price per unit of waste service is calculated. If households are not responsive to a user charge, the demand curve

will be nearly vertical and the welfare loss caused by a zero price for such services should be negligible, since Q_z will be close to Q^* .

For households in urban areas in developing countries, clearly, it is not a question of the responsiveness to an user charge but rather the willingness to pay such a user charge for waste services. In Pakistan, for instance, households consider the provision of such services to be an obligation of the local government and resent paying for them (Altaf and Deshazo, 1996). In general, poor communities in which traditional public services are considered more or less satisfactory by the population, observe the financial responsibility to be a governmental one (WB, 1992). Nonetheless, the idea is to create a sustainable system of public services which, among other things, imply that the beneficiaries themselves fully pay for the provision of solid waste services. The level in which the costs are being covered, depends on the total amount of funds gathered from the participating households. And thus relates to the monthly expenditures households are willing to spend on the deliverance of the waste services and to the percentage of households willing to participate. Under general conditions based on empirical findings of Whittington *et al.* (1991), Altaf and Deshazo (1996) we can depict the tradeoff between the price of the services in the form of willingness-to-pay bids, and the percentage of households willing to pay for it.

Consider Figure 2. In this graphical presentation the relationship between the percentage of households willing to contribute for solid waste services under different prices becomes apparent. The two lines are downward sloping, using the left vertical axis, because of the budget constraints households face. This simply states that the willingness to contribute for waste services declines if the price augments because of limited financial resources. And a solid waste service is a normal economic good for which households need to consider their expenditures. Therefore, the line of those households, which can afford more, drops less fast than the depicted line of households with little financial resources. The starting point bid for both lines, *i.e.* the price for which everyone is willing to contribute, depends partly on the level of income of the beneficiaries, and partly on the survey method used to discover the willingness to pay; the latter is referred to as the starting point bias (OECD, 1994).

Based on the relationship presented in Figure 2, it is possible to visualize the revenues associated with different prices for solid waste services. This is done in the same figure, using the vertical axis on the right measuring the revenues in local currency⁵. Then, taking the correct axis into consideration, it becomes merely a simple arithmetical problem to understand the shape of the two revenue curves. The exact intersection in the maxima of each of the two revenue curves with the corresponding two depicted "willingness-to-pay" lines results from the fact that the horizontal axis stays the same in both cases. Note that the maximum of the "rich" revenue curve not only surpasses the maximum of the "poor" revenue curve but also lies to the right of it, implying that rich households, on average, are willing to pay a higher price for the provision of waste services.

⁵ For eager readers, total revenues are being calculated by the multiplication of (a) the proportion of households, which decide to participate, (b) the total number of participants under which the research is implemented, and (c) the price of solid waste service charged. In addition, if the price for waste services also depends on the weight of refuse discarded, say in kilograms, then the daily generated refuse per capita has to be added to the sequence of multiplication.

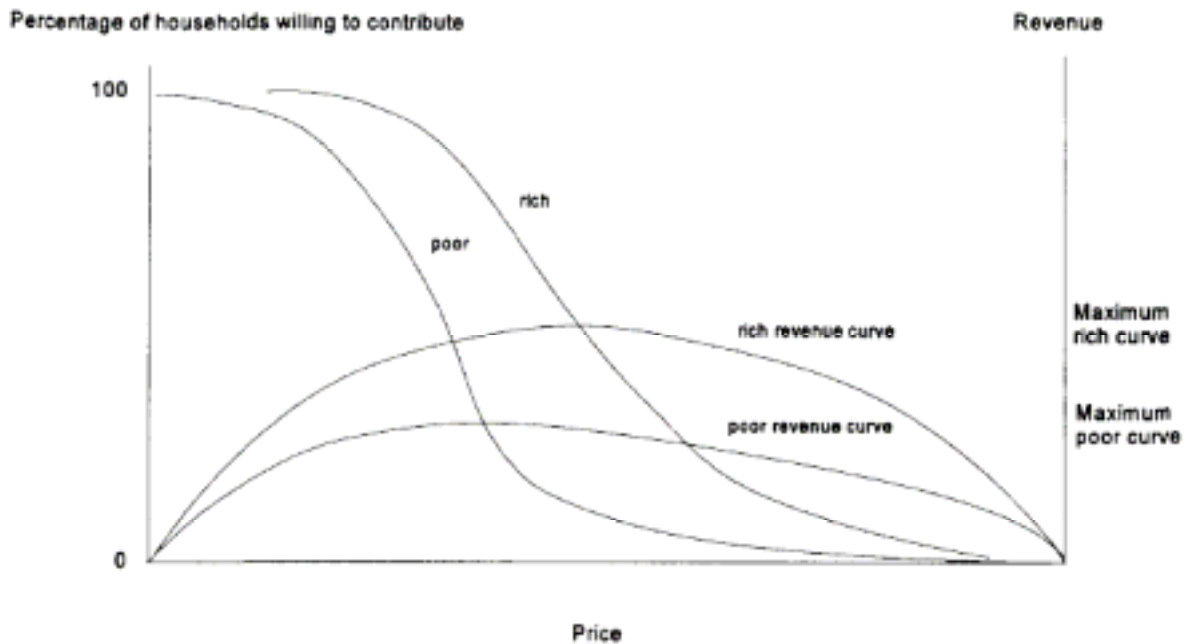


figure 2.

With the above knowledge, Figure 3 is able to explain the trade-off between social and financial objectives with which the responsible government is confronted. When this figure is taken for a detailed analysis and we move from the left corner to the right corner, first both revenue and the percentage of households desiring to contribute to solid waste services increase. However, the revenues will not increase continuously because the percentage of households which are willing to contribute decline when the price of services rises. Therefore, a specific percentage of households for which the revenues are at its maximum exist.

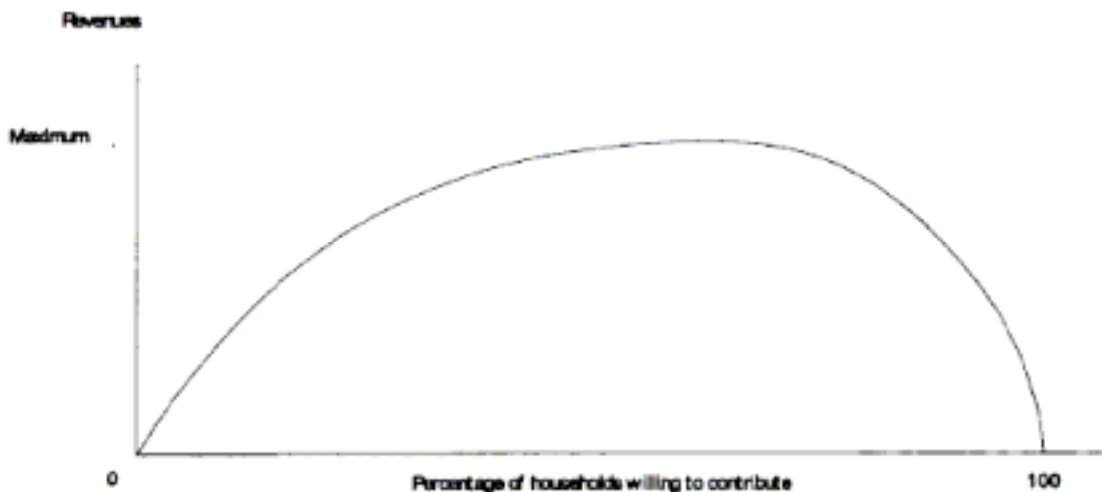


figure 3.

If we turn to Figure 3, it becomes obvious that increasing the total revenues at a point right of the maximum, the percentage of households taking part in the solid waste system must be reduced. This important fact, then, forces the authority responsible for the provision of solid waste services to choose between financial objectives on the one hand, and social, environmental and public health objectives on the other. When the latter prevails, it must be clear that the revenues will not be at its maximum. Thus the choice favours a lower price paid for the service provision with a corresponding higher percentage of households contributing. However, before any of these curves can be depicted on existing data, the willingness-to-pay bids must be registered. Thus the question surges how to measure the willingness to pay for solid waste management services in order to provide a sustainable service of refuse collection, transport and disposal.

CHAPTER 4 METHODS OF AFFORDABILITY TO PAY AND WILLINGNESS TO PAY

Municipal solid waste management (MSWM) is an integral part of the broad urban and environmental management of a city. To maximize the efficiency and effectiveness of investments in this sub-sector, projects need to be addressed to the full range of solid waste operations and the related environmental, institutional, and financial issues (Bartone and Berstein, 1994). This implies that the marketing of MSWM should include a) the collection and disposal of solid waste generated by all population groups at a certain level and that costs can be sustained locally, b) the sufficient protection of the environment, c) an appropriation of systems to local conditions, and d) labour productivity and employment.

For the MSWM to be efficient we have to administer the financing of investments in solid waste management services. To finance capital investments, municipal governments have three principal options being loans from existing financial intermediaries, special loans or grants through the central government, or municipal sinking funds. To finance the substantial recurring costs of MSWM, municipalities can obtain funds from local taxes, intergovernmental transfers, and user charges (Bartone and Bernstein, 1994). Although local conditions will determine the means by which the costs of solid waste services should be recovered, attempts should be made to recover the maximum amount of collection costs through user charges from households because most local governments experience a serious shortfall in meeting their revenue needs from their tax base (Cointreau, 1994).

Generally, the willingness to pay will be affected by satisfaction with present levels of services, costs incurred on service augmentation/substitution, historic pricing systems and socio-economic characteristics such as household size, assets owned, education and occupation head (Mani *et al*, 1997). Moreover, aspects such as gender, age and marital status are also determinants of the level of willingness to pay as has been indicated in a research determining people's support, priorities and willingness to pay for environmental management programs in the Philippines (Tejam and Ross, 1997). How, then, to examine the (maximum) willingness to pay?

4.1 Types of valuation techniques: how to measure the willingness to pay

Several techniques for assigning economic values to non-market goods and services have already been analysed in literature. The valuation task is to determine how much better or worse off individuals are, or would be, as a result of a change in the provision of a public service or in environmental quality (OECD, 1994). Economists define the value of a change in terms of how much of something else an individual is willing to give up to receive this change, or how much they would accept in order to permit the change to occur. Thus, the question is how can a researcher know what an individual would be willing to give up (or to pay) in order to have a specified change in the provision of the public service or environmental quality occur?

First of all, one could simply experiment. For instance, if we want to know how much people value a potential new national park, the park could be created and an entrance fee could be charged without consulting the visitors *ex ante*. However, large experiments of this kind are difficult to design and, most likely, politically impossible to implement.

A second method to measure the value of a non-market good has been developed and rests on the idea of surrogate markets. To use this technique, a good or service that is sold in markets and is related to or bundled with the non-market service has to be found. In this situation the individual may reveal his or her preferences for both the market and non-market service when he or she purchases the market good. This surrogate market method is also known as the hedonic property value method.

A third approach also used to determine the value of a good or service, is based on damage. For changes in the provision of a service that reduce individuals' well-being, we can attempt to ascertain the damages an individual will suffer. A deterioration in the quality of the provided good could cause a loss of productive assets or loss in earning power. A person could be made well or restored to their initial state of well-being by being compensated in money or other goods or services by the amount of the loss. Together with the surrogate market technique, this "damage function" approach are termed indirect valuation methods because neither rely on people's direct answers to questions about how much they would be willing to pay (or accept) to have a change in the quality of the provided good occur. An other approach to obtaining estimates of the value of goods and services takes a somewhat different tack. Rather than developing new estimates of value for the services of interest, estimates of value can be found for the same or similar good or service in other locations, and then transfer these estimates to the location of interest. This method is also denoted as the "benefit transfer" approach.

The most straightforward method, however, is simply to ask people how much they would be willing to give up, *i.e.* how much they would be willing to pay, to have a specified quality improvement happen. In this direct or "stated preferences" approach individuals are directly asked to state or reveal their preferences for the service or good provided. If people were able to understand clearly the change in the quality of good being offered, and answered truthfully, then this direct approach would be ideal. That is often not the case. The problem is whether the intentions people indicate *ex ante* will accurately describe their behaviour *ex post* when they face no penalty or cost associated with a discrepancy between the two. Nevertheless, comparing the number of applications of the different valuation techniques, there are a large number of applications of the stated preferences method (OECD, 1994). This is in part because the method is flexible in terms of data requirements and can be applied to many different kinds of valuation problems. For this reason we address some attention to this method.

4.1.1 The contingent valuation method

The stated preferences approach is better known as the contingent valuation method (CVM), which, as noted above, attempts to elicit information about individuals' (or households) preferences for a good or service⁶. The CVM can be used to obtain values of private goods, goods with both private and public characteristics, *e.g.* various kinds of infrastructure, and pure public goods, such as solid waste services. Often it is used to assess preferences for goods and services for which a conventional market does not exist. Here a hypothetical situation must be described to the respondents in the questionnaire. The respondent is then asked one or more questions to

⁶ The technique is termed "contingent" because the good or service is not, in fact, necessarily going to be provided by the enumerator or research analyst. The situation the respondent is asked about is hypothetical.

determine how much he or she would value a good or service if actually confronted with the opportunity to obtain it under the specified terms or conditions. Through a bidding process, or a reiterative presentation of yes/no questions, the maximum willingness to pay is acquired. In order to relate the answers respondents give to the valuation questions to other characteristics, CV survey instruments usually include a series of questions about the socioeconomic and demographic characteristics of the respondent.

Because of two important reasons the contingent valuation method takes a widespread interest in the environmental economics and public choice theory. First, the CVM is the only practical means of estimating some kind of environmental and public good benefits. Secondly, the evidence from existing research suggests that estimates of environmental and public good benefits from well-designed and properly executed contingent valuation surveys appear to be as good as estimates obtained with other valuation techniques (OECD, 1994; Mitchell and Carson, 1989; Whittington *et al.*, 1990). Yet, applications of the CVM in developing countries are still rare. Some studies of household demand for improved urban services in developing countries have been implemented but are few in number and emphasize merely sanitary and water services. The number of literature on willingness to pay for, albeit improved, solid waste services is even smaller. Still, the contingent valuation method seems to be a feasible and valid technique to measure the level of payment for sanitary and solid waste services in developing countries (Altaf *et al.*, 1994; Altaf and Deshazo, 1996; Whittington *et al.*, 1991).

Nonetheless it is important to distinguish between water supply and sanitation services on the one hand, and solid waste services on the other when it comes to the execution of the CVM. Unlike water supply, or latrine usage (or even electricity), which can be readily cut off for nonpayment of user charges, solid waste services can not be discontinued without jeopardizing public welfare. Therefore, sanitary services can be described as "private" goods in the sense that the primary benefits accrue to individual households, whereas solid waste services, in which the benefits accrue to the community at large, has to be considered public goods. It is almost impossible to cut off households from solid waste services as a consequence of nonpayment.

However, solid waste services can be treated like a private good. Treating solid waste services as a private good depends on the education, culture and perceptions of the residents (Cointreau, 1994). In communities wherein residents have been sensitized to the need for public cleanliness, the collection service to households or other refuse generating groups can be treated as a private good for which those being serviced would be willing to pay. The social cohesion of the residents is then enough high to prevent non-payment to occur.

4.2 The affordability to pay

Understanding the willingness to pay for waste services only, is insufficient for a successful research of efficient and effective improved solid waste services. Here the affordability to pay comes into play. Still, much literature does not consider the aspect of affordability to pay, for it is argued "what one is willing to pay, one can afford". In general, there is a lot of evidence supporting this idea but it is forgotten that the willingness to pay is a function of the affordability to pay and the demand for services, included the nature of existing services in use (the latter is

explained in paragraph 5) (Mani *et al.*, 1997). Not knowing the affordability to pay implies the danger of a failure of recovering the full costs of (improved) solid waste services.

When implementing the contingent valuation method a bias occurs in the search for the true willingness to pay and thus making the knowledge of affordability to pay significant. Suppose an individual is asked how much he would be willing to pay to have the refuse being collected in front of his house. If he thinks the supplying agency will provide the service if the responses of individuals in the area are positive, but that someone else will ultimately pay for the service, he will have an incentive to overstate his actual affordability to pay in order to have the service provided (Whittington *et al.*, 1990). Therefore, at least some information is needed on the economic situation of individuals or households taking part in the research, in order to compare the (maximum) willingness to pay with the level of income of the respondents.

Even so, information about the affordability to pay of respondents makes it possible to calculate the overall cost recovery of the provision of solid waste services *ex ante*. If one is dependent on user charges only, especially when private enterprises are responsible for their own financial viability, then information about the level of affordability to pay of households for services provided becomes vital. Insufficient affordability to pay make investments nonprofitable regardless the willingness to pay, especially when lower income groups are considered. This is true, for instance, in Bangalore and Ahmedabad in India where higher and middle income groups have the affordability to enhance their services corresponding their income levels and needs for services, whereas the lower income groups cannot afford either large investments or even high monthly charges (Mani *et al.*, 1997).

CHAPTER 5 THE ASSESSMENT OF THE DEMAND FOR SERVICES

The lack of information about the nature of consumer demand is considered to be an important contributing factor to the poor performance of public services among which are public water and sanitation systems and solid waste services (WB, 1993; Altaf and Hughes, 1994). Understanding demand for (improved) waste services is the key to an effective marketing research for solid waste management services.

Generally, the acquirement of demand information is relatively easy and inexpensive providing a useful input in planning the provision of public waste services (Altaf and Deshazo, 1996). The information can be used to increase consumer welfare by providing services that are most in demand and to improve cost recovery by tapping into consumer willingness to pay. The information could pertain aspects like preferences over components of existing solid waste services, for example the cost for services, the frequency of collection. Or the overall satisfaction with waste services, or other needs, like the preferred disposal site. If available, the best way to indirectly analyse the demand for solid waste services in urban areas is to use statistics, or for instance, existing research data about the amount each household generates daily. This per capita (or family) generated refuse must be multiplied by the number of individuals (or families) to indicate the total amount of waste being created per day. Next to that, the estimates of the amount of waste collected per worker per hour in the households' area an indication can be given of the total amount of refuse collected and disposed off. The difference between the total amount of waste generated and the amount of solid waste collected, enables us to calculate the amount of waste not being collected daily. A positive difference indirectly shows a potential demand for waste collecting, transport and disposal.

A direct way of obtaining demand information is simply to ask household members about their preferences for new or improved public waste services. In line with the contingent valuation method, a survey can be implemented and by doing so information is gathered to determine the needs for waste services. Another direct way of collecting demand information is to create or improve citizen participation in public policy decision through open hearings or citizen interest groups (Altaf and Deshazo, 1996).

The problem generally is not merely how to discover the demand for solid waste services but rather to create a certain level of demand for these services. This involves treating households as potential customers who are seen as a market for solid waste services. Successful demand creation, then, is linked to the willingness to pay (Ikin, 1994). Estimating the maximum amount households are willing to spend on the waste services provided, offers the local government or a private enterprise the option of taking the financial gains, if profitable, and the community taking the benefits of greater well-being. Furthermore, it asks for social mobilization programmes in order to awake the population to take affordable action, which means that demand creation can work when linked to an affordable range of services. The focus on an affordable service produced with known technology and promoted by people with status in the community has been a successful demand creation for latrines in Bangladesh (Ikin, 1994).

CHAPTER 6 THE ASSESSMENT OF SOLID WASTE SERVICES IN NORTH COUNTRIES

As mentioned in the assessment of one of the sub-objectives, the research investigated the marketing methods in North countries. It was expected that from this perspective a feasible translation could be made using the existing western marketing methods for solid waste collection in developing countries. However, resulting from interviews and literature study, the research did not succeed to make this translation. Nevertheless, a brief account of the results of this investigation is given in the next sections.

6.1 The Dutch case

The aim of the Dutch national policy on waste management is to minimize the quantity of waste that has to be incinerated or dumped. Therefore, waste reduction has to be encouraged combined with recycling; in the Netherlands the so-called "Ladder van Lansink" is implemented. This "Ladder van Lansink" mentions the need for an environmentally sustainable way of dealing with the processing of waste refuse. It is a national approved guideline and in essence it accounts for the prioritisation of the different streams of waste, namely in descending order of importance, the prevention of waste generation, the reuse and recycling of waste, the incineration and, finally, the landfilling of waste refuse (AOO, 1996). In the National Environmental Policy Plan Plus an overall goal is formulated for waste disposal, being a reduction of waste of 8 million tonnes per annum to 12 million tonnes in the year 2000 (De Jong and Wolsink, 1997).

In the Dutch waste policy and research much attention has been paid to the formulation of targets and regulations and to the selection of policy instruments. The size and composition of waste streams is determined by several factors like demographic developments, economics developments and technological trends. The fact that the size and composition of waste flows is also determined by the social context in which the removal and processing of waste takes place, is too often neglected (De Jong and Wolsink, 1997).

In the Netherlands there are numerous organizations, both public and private that try to influence the ways and the extent to which solid waste is handled. Most organisations, however, have no interest in limiting waste streams or in altering the kind of waste that has to be processed or disposed of. In general, four categories of actors on the waste market can be discovered, being consumers, collectors, processors and disposers. Beside the participants in the waste market other actors participate in the much broader waste sector. They are concerned with policy, or with supporting and influencing waste management policy (policy making authorities, interest groups and umbrella organizations) (Bergval, 1997). To understand the structure of the Dutch waste market, the participants must be analysed as to clarify the aspects of supplying solid waste services.

6.1.1 Consumers

Solid waste, all discarded materials and products that have been sent to disposal facilities, is generated by different entities. There are "consumers" of the services of organizations involved in collecting and removing waste. Consumers can be divided in a) households, b) institutions like schools and hospitals, and c) businesses from small enterprises to large industries. In the Netherlands households are using the services of public waste collectors which in practise have a

monopoly over household waste disposal. These services legally entail the separate collection of kitchen/garden refuse and other municipal solid waste. The rate is set by the local government, which is normally a flat monthly rate for the services provided, so there are no marginal rates. However, some experiments are carried out with tariff differentiation based on volume, on frequency of offering or on weight, with different success (*see also* 1PH, *tariff differentiation on domestic waste*, 1994). One municipality, Haarlemmermeer, started with tariff differentiation based on frequency of offering. The experiment failed as a result of technical shortcomings. A successful experiment with differentiation based on automatic classification, weighting and registration of containers has been carried out in Oostzaan. The tariff consisted of a fixed rate and a variable price per kilogram waste discarded (De Jong and Wolsink, 1997). Institutions and small enterprises may offer their waste to municipal utilities, but they also have the opportunity to contract a private waste collector with a permit. With respect to these consumers the municipality has no monopoly. Large companies or industries have to contract a private organization for collecting the refuse discarded. As from the first of January 1996, industrial enterprises need a permit from the provincial authority to do so. The permit prescribes separation of certain components and registration of weight, type and destination of the outgoing waste (De Jong and Wolsink, 1997). The collecting organization is obliged to report acceptance of solid waste. In short, the consumers have in common that it is in their interest to have the waste collected as cheap and efficiently as possible. Households, however, have no direct influence on the price they pay, whereas the other consumers are free to choose their collectors and to negotiate the contract conditions.

6.1.2 Collectors

Within the Dutch waste market, waste collectors, public or private, are organizations that collect and transport or transfer solid waste. Municipalities have a legal obligation to collect solid waste at least once a week. They are obliged to collect garden and kitchen waste separately. As "agents" of the public interest they have to develop and maintain a reliable, efficient and cost-effective system of solid waste removal and disposal. Most Dutch municipalities carry out their own public service although there is a tendency to hire private waste collectors to fulfil their legal commitment. Examples such as the municipalities of Dordrecht and Zwijndrecht, Etten-Leur, Tilburg and Watergraafsmeer show that privatisation of household collection can be rendered more efficiently and effectively. The level at which the enterprise is independently operating depends upon the contract signed with the local government. The enterprise takes over the primary services, which the municipality was responsible for, and is thus forced to improve his "care taker role", or in other words to meet the demands of the households. The service or collecting formula differs for each municipality for reasons of geographic location, house construction, like flats or separate houses, the form of collecting waste, and technology choice. The ultimate policy responsibility stays with the local government. The bulk of municipal solid waste generated by enterprises and industries, is collected by private organizations. These waste collectors earn profits by providing their services to municipalities and non-household consumers on the one hand, and on the other by finding ways to transport and deliver the collected waste to the cheapest disposal site. There exist a variety of private collectors operating at the local level and on a national scale (AOO, 1996).

6.1.3 Waste processors

Organizations involved in any kind of waste treatment are called waste processors. In the Netherlands, the supply of secondary materials, like paper, textile or scrap, increased since 1970 as a result of new technologies that created economically feasible options for recycling and re-use. Stricter regulations laid down by the national government, increasing costs for disposal and the expected shortage in landfill and incineration capacity have given a strong impulse to recycling and re-use, giving a boost to the demand for secondary materials.

6.1.4 Waste disposers

Waste disposers are those organizations that take care of land filling and incineration. Although the exploitation of disposal sites is often in private hands, in most cases public authorities are owners of the sites. In the Dutch waste sector public authorities have the legal task to develop and maintain a system of waste handling that services all locations in a reliable, cheap and efficient manner. This task has become more complicated because of recent developments such as the growing quantities of waste and stricter environmental standards (De Jong and Wolsink, 1997). Furthermore, higher investment levels and restricting pay-back periods have forced disposers to utilize their full capacity. And so disposers try to avoid uncertainty by creating a sufficient and guaranteed incoming flow of waste. They simply try to force collectors and processors to deliver collected solid waste to them. Beside the organizations participating in the waste market, some other groups of actors participate in the waste sector. First, there are governmental bodies that try to formulate and implement waste policy. Second, there are research groups and consultancies that provide data and ideas to support the process of policy making. Third, there are those organizations which try to influence policy makers and political bodies. Although these three groups of actors are not part of the waste market, as they do not channel any waste flows themselves, their influence can be significant (De Jong and Wolsink, 1997). The main source of influence on conditions for waste removal, handling and disposal stems from their legal authorisation to intervene.

6.2 Conclusion

Summarizing the Dutch case, it can be noted that in the current structure of the waste sector in the Netherlands there are impediments discouraging waste generators from developing waste reduction activities. Conditions for collectors, processors and disposers affect the amount and type of generated waste. The structure of the waste sector often creates entwined interests and perhaps as a unintended result of this, waste generation is often stimulated rather than restricted.

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