

Research Application Summary

Willingness to pay for sound waste management in urban and peri-urban areas of the Lake Victoria crescent region Uganda

Ekere, W.¹, Mugisha, J.¹ & Drake, L.²

¹Department of Agricultural Economics and Agribusiness, Makerere University P.O. Box 7062 Kampala, Uganda

²Swedish Chemicals Agency, P.O. Box 2, SE-172 13 Sundbyberg, Sweden
Corresponding author: wekere@gmail.com

Abstract

Waste management constitutes one of the most crucial health and environmental problems facing local governments in Uganda. In the Lake Victoria crescent region, Kampala residents generate over 1,500 tons of waste per day. However, only a small fraction is collected due to budget constraints. Uncollected or illegally dumped wastes lead to environmental degradation. High generation volumes could be because the households do not pay the full social costs of waste disposal. Using regression analysis, the study assessed the determinants of waste generation and established the willingness by households to pay for sound waste management. Six socioeconomic variables influenced willingness to pay resulting into significant welfare benefits once it is universally practiced.

Key words: Environment, social costs, waste, willingness to pay

Résumé

La gestion des déchets constitue l'un des problèmes les plus cruciaux de la santé et de l'environnement auxquels font face les autorités locales en Ouganda. Dans la région avoisinante du lac Victoria, des habitants de Kampala produisent plus de 1.500 tonnes de déchets par jour. Cependant, seule une petite fraction est recueillie en raison de contraintes budgétaires. Les déchets non-collectés et ceux déversés illégalement ont comme conséquence la dégradation de l'environnement. Les plus grands volumes de déchets produits pourraient se justifier par le fait que les ménages ne paient pas la totalité des coûts sociaux de l'élimination des déchets. En utilisant une analyse de régression, l'étude a évalué les causes de la production de déchets et a établi la volonté des ménages à payer pour la gestion rationnelle des déchets. Six variables socio-économiques ont influencé la volonté de payer résultant dans les bénéfices importants du bien-être social une fois que cela est pratiqué par tout le monde.

Mots clés: Environnement, coûts sociaux, déchets, volonté de payer

Background

Waste management constitutes one of the most crucial health and environmental problems facing many local governments in Africa and Uganda in particular. In the Lake Victoria crescent region of Uganda, the rapid rate of urbanization, the high urban population growth rates as a result of rural-urban migration and the demand for food stuffs marketed in raw form have resulted into generation of high volumes of waste. For example, Kampala city alone generates approximately 1500 tons of waste per day. This has put a strain on many local government budgets as they use approximately 20-50% of this on waste management and yet only a fraction of the waste is collected. Uncollected or illegally dumped wastes and subsequent environmental degradation are the result. Studies have indicated that market crop wastes are potential sources of nutrients for improving soil fertility (Sendawula *et al.*, 1997), agricultural productivity (World Bank, 1997) and livestock productivity (Nambi, 2001). The direct impact of improvement in solid waste conditions is better health which improves productivity and raises incomes (Bernstein, 2004). Generation of high volumes of waste may be because the urban and peri-urban households do not pay the full social costs of waste disposal. This study was therefore done to assess the determinants of waste generation and establish the willingness to pay for sound waste management by households in the Lake Victoria crescent region of Uganda

Literature Summary

Many studies have been done in developed countries and a few in developing countries on the household waste management problem. Wertz (1976) provided one of the earliest theoretical models of demand by households for solid waste disposal services and found a price elasticity of demand equal to -0.15 meaning that an increase in unit prices had a small negative effect on waste disposal. Sterner and Bartelings (1999) reported that the studies analyzing household waste generation and management rely explicitly or implicitly on the utility theory of the consumer or household production to derive a demand function for solid waste management services. Karavezyris (2000) discussed various models associated with the estimating waste generation and observed that it is based on economic activities and time. The contingent valuation method used in this study is a stated preference method used to estimate the value of non-market goods in a plethora of different fields. Anand (1999) used it in a study in Madras to examine the issue of waste management and elicit people's preference for a new waste management approach. Yusuf *et al.* (2007) used it to establish determinants of improved waste management in Nigeria.

Study Description

A random sample of 577 households in five urban and peri-urban areas of the Lake Victoria crescent were surveyed. Using OLS the determinants of waste generation by the households was established. Contingent valuation methodology and a logit regression model were used to establish the factors influencing willingness to pay for sound waste management. For contingent valuation, a description of the waste collection service being offered including the conditions of availability were presented to the respondents in order to elicit their willingness to pay for it with minimum bias. Willingness to pay for sound waste management was modeled as a function of socioeconomic and demographic variables. Using parametric method, based on the Hanneman (1984) formula, the mean willingness to pay for sound waste management was computed.

Research Application

The socio demographic characteristics of the respondents showed that the average age of the respondents was 40 years with a minimum of 18 and a maximum of 81 years. The waste generation levels in the five urban areas were quite high. Waste generation levels per capita stood at 1.2 kg per head per day in Kampala, 1kg in Iganga and 1.3 kg in Masaka. Sampled households spent on average 120 minutes per week on waste related activities. Peri-urban households on average spent 24 minutes per day compared to 18 minutes spent by urban households. Households generated on average 18.6 kg of crop wastes per week. There was a significant difference at 1% level in quantity of wastes generated by urban and peri-urban households. Peri-urban households on average generated 24kg of crop waste per week compared to 16.5 kg per wk by urban households. Households were on the whole willing to pay for sound waste management. The OLS regression showed that income, age and household size influenced waste generation. The logit regression analysis revealed that income of the household head, location of the household, gender of the household head, level of environmental concern, age of the household head and quantity of crop waste generated by the households were significant and explained the households willingness to pay for waste management. Households were willing to pay on average 1,165 Ug. Shs (\$0.58) per week for sound waste management. It can be concluded that the willingness of many households to pay for waste management would result into significant welfare benefits.

Recommendation

The results provide a basis for setting of waste disposal fees by urban authorities given the willingness of a majority of

households to pay for it. In setting waste collection fees, urban authorities should pay attention to location and income of residents. A new policy covering crucial issues of environmentally friendly waste disposal, cost-recovery, institutional structures, public education, and waste minimization needs to be developed as part of a new solid waste management strategy. The mean WTP for improved waste management was positive implying that they benefit from the improved waste management. They should therefore pay for the improved waste management service.

Acknowledgement

This study was financed by Sida.

References

- Anand, P.B. 1999. Waste management in Madras Revisited. *Environment and Urbanization* 11(2):161-176.
- Bernstein J. 2004. Toolkit for social assessment and Public Participation in Municipal Solid Waste Management. *ECSSD Urban Environ. Thematic Group*. pp. 51-55.
- Hanemann, M.W. 1984. Welfare Evaluations in Contingent Valuation Experiments with Discrete Responses *American Journal of Agricultural Economics* 66(3):332-341.
- Karavezyris, V. 2000. Theoretical approaches to forecasting of solid waste. A paper presented at the 4S/EASST Conference, September 2000, Vienna
- Nambi, J. 2001. Effects of supplementing elephant grass, sweet potato vines, banana peels banana peels and maize leaves with leguminous tree foliage on the performance of lactating dairy goats. *MSc. Thesis, Unpublished Makerere University*.
- Sendawula, J., Tenywa, J.S. and Zake, J.Y.K 1997. The potential of urban market garbage as a soil fertility input: The case of Kampala city. *African Crop Science Conference Proceeding* 3: 275-282.
- Sterner, T. and Bartelings, H. 1999. Household Waste management in a Swedish municipality: Determinants of waste Disposal, Recycling and composting. *Environmental and Resource Economics* 13:473-491.
- Yusuf, S.A., Salimonu, K.K. and Ojo, O.T. 2007. Determinants of Willingness to Pay for Improved Waste Management in Oyo State, Nigeria. *Research Journal of Applied Sciences* 2(3): 233-239.