

# THE ECONOMICAL, SOCIAL AND ENVIRONMENTAL IMPLICATIONS OF INFOMAL WASTE COLLECTION AND RECYCLING

**Ştefan Gabriel BURCEA**

*Bucharest University of Economic Studies, Romania*  
*stefan.burcea@gmail.com*

## **Abstract**

The local economy of a community is equally supported by the formal sector, but also by the informal sector. While the formal economic activities are carried out through modern, technologized, industrialized means, within public or private organizations whose existence is officially recognized and benefiting from the protection of the authorities, the informal activities exist outside the official control and protection system. There is a dynamic connection between the actors in the formal sector and those in the informal sector, which is seen at the levels of production, distribution and consumption of goods and services.

This article analyzes the waste recycling informal activities carried out by persons or enterprises involved in the extraction of recyclable materials from generated waste and evaluate the informal waste sector perspectives and implications from three points of view: economic, social and environmental. Even though, at first sight, the informal waste collection and recycling is neither efficient, nor viable, the social, economic and environmental benefits resulted from waste valorization possibilities are clearly superior in the informal waste sector compared with formal waste activities.

**Keywords:** informal waste, informal waste sector, informal waste benefits, informal waste collection, informal waste recycling

## **1. INTRODUCTION**

The waste recycling informal activities are those activities carried out by persons or enterprises involved in the extraction of recyclable materials from the mass of wastes generated within the community (Ezeah et al, 2013). Even though, at first sight, the informal collection and recycling of wastes is neither efficient, nor viable, Chi et al (2011) believe that the informal sector benefits from waste marketing and capitalization possibilities that are clearly superior to the formal waste management ones. Katusiimeh et al (2013) consider that there is a dynamic connection between the actors in the formal sector and those in the informal sector, which is seen at the levels of production, distribution and consumption of goods and services.

Gunsilius et al (2011) analyze the informal activities of the waste management systems in developing countries and they conclude that there are 4 categories of activities: informal waste collection, informal recovery of recyclable material wastes, informal production activities and supply of associated waste management services.

The informal collection of wastes is carried out in the areas where sanitation services are not delivered by municipalities, especially in the developing states. The informal collectors use manual trolleys or carts pulled by animals or rudimentary motorized vehicles to collect and transport wastes, asking for charges from the population of these areas; subsequently, the recyclable waste materials are recovered from collected waste and traded by third parties in order to reuse or recycle them in the waste management official system. The informal recovery activities of recyclable waste from the generated waste are most widely spread. Such informal activities are found in areas where recyclable material wastes are accumulated, like streets, greenfields, lakes and rivers, landfills etc. and they suppose a part-time or full-time daily schedule.

The informal activities of production and manufacturing carried out by enterprises, in an organized or individual manner, using materials recovered from wastes as raw materials, are circumscribed, according to Gunsilius et al (2011), to the informal sector of waste management. The same category includes the informal activities that suppose the conversion of organic wastes to compost, and any other activities bringing added value to waste; in fact, the informal actors carrying out such activities may generate clearly superior incomes to those obtained by the informal waste collectors.

The informal waste sector also includes activities that suppose the provision of sanitation services, mainly street cleaning, or other street facilities. In the developing states and under-developed countries, the informal waste collection and the informal supply of street sanitation services interferes very little with the formal economy, while the recovery of recyclable waste materials from the generated waste and the production activities using as raw materials the recyclable waste are usually part of the formal economy.

Gerold (2009) shows in a similar vision the typology of informal waste activities: the supply of services related to waste collection and transport, activities that are directly related to the recycling of biodegradable and non-biodegradable waste, distribution of recyclable waste and of recyclable raw materials (including their purchasing, storage and trading), and the use of recyclable materials as raw materials in manufacturing processes.

At the world level, there are millions of people earning their living by collecting, sorting and recycling waste, objects, products or materials thrown away in their community. Gunsilius (2012) specifies that, in

reality, there are very few and very limited statistic data reflecting this phenomenon. Medina (2007) estimates that more than 2% of the population in the under-developed and developing states is involved in informal waste collection activities, with the declared purpose to provide the minimum living level. Zia et al (2009) state that it is difficult to estimate the size of the informal sector where official census and statistics (local and national) do not reflect this phenomenon, which makes the access to certain data impossible as regards the part, size and contribution of informal recyclers at community level.

## 2. THE CUREENT CHALLENGES OF INFORMAL WASTE ACTIVITIES

The informal waste activities mainly aim at the recovery of fractions and recyclable materials from domestic waste, commercial waste, street waste etc. The informal activities gravitate around dustbins or garbage containers at the level of street sanitation, as well as at the level of domestic sanitation, or they are carried out directly on the waste dumpsites serving communities in the urban environment. The informal collectors carry out their activity by searching through garbage and looking for various used products and recoverable materials; some of them trade wastes to intermediates (Matter et al, 2013), others prefer to capitalize material waste directly from sanitation operators authorized to recycle waste.

Part of the informal recyclers from developing countries work without legal forms in informal waste sorting/recycling centers owned by various cooperatives, lucrative or professional associations. Asim et al (2012) and Rockson et al (2013) analyze the work conditions and the organization manner in informal activities of waste collection, sorting, recycling and/or capitalization and they conclude that they differ from one region to another, from one state to another, and worldwide, from one hemisphere to another. Meagher (2011) claims that, despite the diversity of categories and typologies of informal waste activities, the informal collectors carry out such activities with the essential goal to earn their living and to contribute to the financial support of household and families they are part of.

The informal activities provide the fundament of the entire waste management system in urban areas (Gunsilius, 2012; Ciocoiu and Târțiu, 2012). The persons benefiting from the activity and performances of informal collectors are authorized recyclers, which in the official waste management system they contribute to the reaching of targets/goals concerning waste recycling, and to the local development of community. Contrary to this certainty, the local authorities avoid the informal recyclers, and they do not recognize their activities and services to community sanitation and the general perception is that they are insignificant in terms of their part and contribution to the formal waste collection and recycling (Nzeadibe, 2009). Gutberlet (2008) and Sembiring and Nitivattananon (2010) believe that the authorities' indifference concerning informal activities is supplemented by the marginalization and

discrimination of informal collectors by the society, and even by the persecution of this category by public bodies providing security and public order. All these aspects negatively influence the social status of informal waste collectors and recyclers, leading to social exclusion and to the emergence of values, beliefs, cultures and behaviors specific to this social category (Wilson et al, 2006).

There is a total lack of initiative and involvement from the authorities concerning the sizing of informal activities in the frame of waste management. The issue of formalize the informal waste collection and recycling is tightly related to knowing the informal recyclers, their number, status and interests, the volume of provided activity and the quantity of waste they are managing, the actual needs to develop this activity sector, the possibility/availability they manifest concerning the formalization of their own activity etc.

The studies and projects carried out in the field until now (for instance, IEMS, WIEGO, TransWaste etc.) have supposed the empirical analysis of the contents and implications of the informal activities and the qualitative assessment of the role, size and contribution of the informal sector within the waste collection and recycling systems; the failure of these initiatives has been determined by the non-availability of the informal waste collection and recycling agents and of the difficulty to identify and draw them in projects. The researchers' avoidance, manifested by the fear to have their statements registered, the refusal to participate in discussions during focus-groups, and the reluctance to provide elementary information concerning the manner to carry out their own activities have constituted impediments to the success of projects.

The reliability of the statistics in the waste management field, in general, and of data strictly related to the informal sector, in particular, is the main issue of research carried out in this field, the sizing of the number, part and contribution of informal waste recyclers being a difficult process due to the seasonality of the executed activities and of the reluctance to state and/or recognize them.

Brazil is the only state of the world that systematically registers and reports official statistic data on the activity performed by informal waste recyclers. Dias (2011) specifies that the data that has been collected and centralized in the frame of the Brazilian statistic system illustrated in 2008 the existence of almost 229,000 persons involved in informal activities of waste collection and capitalization; they provided the highest waste recycling rates of countries in Latin America, almost 92% for aluminum waste, and 80% for paper and cardboard waste. According to the statistics published by the International Labour Organization (2013) concerning the distribution per genders of workers in the informal economy, women constitute less than 1% of the manpower involved in informal waste recycling activities: between 0.1% and 0.4% in seven cities of Western Africa, 0.7% in the Republic of South

Africa and 0.1% in India; behind the apparently low percentages, there is a significant number of informal waste recyclers, impossible to identify with precision.

### 3. DETERMINANTS OF THE OCCURRENCE AND EXTENSION OF INFORMAL ACTIVITIES IN WASTE MANAGEMENT

The geographic and socio-economic conditions specific to certain areas are the main determinant of the existence of informal activities in waste management. Sembiring and Nitivattananon (2010) enumerate the urbanization process, the internal and external migration of inhabitants, the rapid growth of the population, the low level of qualification of manpower, poverty, low level of the quality of life, and lack of sanitation services, as being essential factors of the occurrence and development of the informal sector in waste management. The treatment manners used in the formal waste management system may create conditions that are favorable to the informal collection activities.

Asim et al (2012) consider the unsuitability of waste collection methods, the insufficient sizing of waste collection and recycling facilities in the formal waste management system, the storage in landfills, and the random disposal of waste, as being the causes determining and encouraging the existence of informal waste activities; Sembiring and Nitivattananon (2010) see waste as an extremely subjective concept, underlining that waste are seen by the formal sector as a source of hazards for human health and for the environment, and the informal sector sees wastes as a resource.

The municipalities' incapacity to satisfy the demand for sanitation services within communities is another determinant of the informal waste sector. In a study realized by HABITAT (2010), it is specified that the informal waste recycling results from and is supported by the low performances of authorities in terms of provision of efficient waste management systems. Medina (2005) provides the example of the capital city of the Maldives, Male, where the informal waste collectors provide sanitation services to inhabitants instead of the municipality. On their turn, Adama (2011) and Nzeadibe and Anyadike (2012) claim that the local policies regarding waste management issues, the nature of legislative regulations of municipalities, and the authorities' communication with the civil society are factors that influence the informal waste sector in developing countries.

There is an increasing tendency in the literature to recognize the contribution of the informal waste recyclers' activity to the development of local economy (Babu, 2009), to provide public health and safety, and to preserve the natural resources and the sustainable development of communities (Gerold, 2009). Nevertheless, in general, the informal collectors own an inferior social status than the other

community members, they live and work in deplorable conditions, and they are not supported by the local authorities (Gutberlet, 2008).

#### 4. ECONOMICAL, SOCIAL AND ENVIRONMENTAL BENEFITS OF INFORMAL ACTIVITIES

The literature explores the implications of the informal waste activities, analyzing their role and contribution from the economical, social and ecological point of view. The study „Informal Economy Monitoring Study”, coordinated by WIEGO (2014), supposed the quantitative and qualitative research of the complex issue of informal recycling activities, analyzing the opinion of 763 informal collectors coming from 5 cities of Africa, Asia and Southern America. Within this study, the main categories of economic benefits of informal waste recyclers have been identified. One of the benefits refers to the fact that the informal activity leads to the earning of basic incomes, which are absolutely necessary to provide the subsistence of informal collectors households and families; the same aspect was identified by Rockson et al (2013), while Nzeadibe and Chukwuedozie (2011) agree that the average incomes earned by the informal collectors may be significantly bigger than the minimum incomes guaranteed in any social security system. For 65% of the respondents, the incomes earned from the informal waste collection and valorisation are the main source of income, more than one quarter of the questioned informal recyclers not earning any other income.

The access to waste and the privatization of waste management activities and of waste collection and recycling facilities are the key problems with direct impact on the informal activities, and implicitly on the informal collectors' subsistence. In the frame of „First Global Strategic Workshop of Waste Pickers”, that was carried out in Pune, India, in 2012, the representatives of the informal collectors and recyclers from 22 countries identified the privatization of the waste management systems and the movement of the gravity center from waste storage by energy-recovery waste incineration as constituting two factors with strong negative impact on the informal waste sector, leading, on the long term, to the limitation of the informal collectors and recyclers' access to recyclable material waste. The issue of limited access to waste was reiterated by the informal recyclers included in the study „Informal Economy Monitoring Study”, performed by WIEGO (2014), 73% of them indicating that the limitation of the access to wastes constitutes a major threat for their own activity.

The informal activities carried out by the informal collectors and recyclers allow the supply of recoverable materials to the concerned entities; according to the results of the study performed by WIEGO (2014), more than three quarters of the questioned informal collectors have declared that they have been capitalizing the recovered waste by trading them to formal recycling enterprises; in Pune, India, the informal recyclers collect organic material wastes in order to compost them and to produce

biogas. Thus, informal activities allow the authorized recyclers to extend their activity and waste recycling capacities and to enter new markets (Gunsilius, 2012). Matter et al (2013) believe that the informal activities supply secondary materials to the economic agents of the local market, which may contribute to the stimulation of the local population of recycled goods, to the development of the local market and community economy in general.

According to Gunsilius, Chaturvedi and Scheinberg (2011), there are also other categories of persons that obtain benefits from informal recyclers; the wastes collected by informal activities are capitalized through intermediates, who earn consistent profits from the difference between the price they offer to informal recyclers for the collected waste and the rate they charge to formal recyclers for the traded waste.

By collecting recyclable material wastes (packages, in most cases) randomly disposed of in public areas, the informal recyclers contribute to the provision of public cleaning (Afon, 2012; Asim et al, 2012). Gunsilius, Chaturvedi and Scheinberg (2011) claim, in the study they coordinated, that the informal recyclers manage to save an important quantity of wastes from disposal on landfills and waste dumps, which is the most significant ecological benefit of informal activities. The study shows that the informal recyclers from six municipalities of South America, Africa, Europe and Asia manage to recover almost 20% of the generated quantity of waste (in 3 of the 6 cities included in the study); more than 80,000 informal collectors have been acknowledged to be responsible for the recovery of approximately 3 million tons of waste per year in all 6 cities from the study.

Recycling is without any doubt one of the cheapest and quickest methods to reduce greenhouse gas emissions, according to a research made by Tellus Institute (2008). The reuse, recovery and recycling of materials from waste, even by informal activities, contributes to the reduction of the quantity of raw materials necessary to produce and supply goods and services, and to the preservation of natural resources and energy (Gunsilius et al., 2011).

The existence of the informal waste activities brings multiple benefits to the local authorities, responsible, in fact, with the issue of waste management at community level. In many under-developed countries the informal collectors provide the unique form of urban waste collection, for the lowest cost, and sometimes without any financial obligation from the municipality part. Monirozzaman et al (2011) synthesize the benefits, for the local authorities, obtained from the existence of informal waste collection activities: create new jobs, reduce the quantity of stored wastes, extend the life of waste landfills, preserve primary resources and energy, reduce the pollution caused by waste etc. Regardless whether

it is performed by formal or informal means, recycling helps the community to „advance” towards the top of waste management hierarchy (Asim et al, 2012).

The informal waste collection and recycling activities contribute to the provision of public health and to the improvement of household and street sanitation, especially when the informal recyclers act in areas that are not served by urban sanitation services (Gerold, 2009). The municipal expenses related to waste management services are considerably reduced following the intervention of informal recyclers; Matter et al (2013) warn that, while municipalities’ costs related to waste collection tend to be reduced, it is likely that the expenses related to the treatment of waste may grow, following the fact that, through the informal activities, waste materials that may be capitalized are recovered by the informal collectors, thus reducing the quality of wastes in the official waste management facilities.

According to Habitat (2010), the informal collectors may provide the recovery of 50-100% of the amount of wastes generated in the cities of developing countries. By saving significant amounts of wastes from elimination through disposal, the informal activities of collection and recycling contribute to dumpsite life extension, which is translated into cost savings for the budget of the municipality.

## 5. CONCLUSIONS

The financial advantages of the existence of the informal sector for municipality and community, as a whole, become social disadvantages for the informal recyclers, given the unhealthy conditions of living and work, the phenomenon of social marginalization that they are subject to by the authorities and society, and the lack of self-accomplishment feeling. TransWaste (2012) analyzes the social impact of informal waste activities in 5 countries in Central and Eastern Europe, from the point of view of several stakeholders: informal collectors, recoverable material waste generators, waste recycling authorized operators, municipalities and the society; the study performed for this purpose has certified the difficulty to evaluate the social implications of informal activities, in lack of any statistic data in the field.

The general social implications analyzed in detail by Wilson et al (2006), Gutberlet (2008), Sembiring and Nitivattananon (2010) etc., the social marginalization of informal collectors, their stigmatization, harassment and even abuse, as well as the limitation of the access to the social security system (Monirozzaman et al, 2011) are supplemented by the deep negative implications on the conditions of living and work and, implicitly, on the state of health of the persons carrying out informal waste management activities.

The level of satisfaction of the informal activities, the number of persons whose existence depends on informal activities, the extent to which the informal collectors disturb the inhabitants by their activity, the level of acceptance by the society, the inhabitants’ degree of trust in the informal recyclers and the

extent of the contribution of the informal collectors to waste recycling may become social aspects that could be empirically evaluated in future studies.

## ACKNOWLEDGEMENT

This paper was co-financed from the European Social Fund, through the Sectorial Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/138907 "Excellence in scientific interdisciplinary research, doctoral and postdoctoral, in the economic, social and medical fields -EXCELIS", coordinator The Bucharest University of Economic Studies".

## REFERENCES

- Adama, O. (2011). *The politics of informality: an insight into the informal solid waste recycling sector in Kaduna, Nigeria*. In: Papers presented at the 4<sup>th</sup> European Conference on African Studies "On Whose Terms?", pp. 15–18, Uppsala, Sweden: The Nordic African Institute
- Afon, A. O. (2012). A survey of operational characteristics, socio-economic and health effects of scavenging activity in Lagos, Nigeria. *Waste Management & Research* 30: 664-671
- Asim, M., Batool, S. A. și Chaudhry, M. N. (2012). Scavengers and their role in the recycling of waste in Southwestern Lahore. *Resources, Conservation and Recycling* 58: 152-162
- Babu, G.R. (2009). Socio-Economic Conditions of Informal Workers: A study, *Southern Economist* 48(3): 23-25
- Chi, X., Steicher-Porte, M., Wang, M.Y.L. și Reuter, M.A. (2011). Informal electronic waste recycling: a sector review with special focus on China. *Waste Management* 31: 731–742
- Ciocoiu, C.N. and Târțiu, V.E. (2012). The role of informal sector within WEEE management systems: a Romanian perspective, *Theoretical and Empirical Researches in Urban Management* 7(1): 27-38
- Dias, S.M. (2011). *Statistics on Waste Pickers in Brazil*. WIEGO Statistical Brief No. 2, May 2011, retrieved from: [http://wiego.org/sites/wiego.org/files/publications/files/Dias\\_WIEGO\\_SB2.pdf](http://wiego.org/sites/wiego.org/files/publications/files/Dias_WIEGO_SB2.pdf), May 2015
- Ezeah, C., Fazakerley, J.A. și Roberts, C.L. (2013). Emerging trends in informal sector recycling in developing and transition countries. *Waste Management* 33: 2509–2519
- Gerold, A. (2009). *Integrating the Informal Sector in Solid Waste Management Systems. Basic Aspects and Experiences*, retrieved from: <http://www2.gtz.de/dokumente/bib-2009/gtz2009-0909en-solid-waste-informal-sector.pdf>, October 2014
- Gunsilius, E. (2012). *Role of the Informal Sector in Solid Waste Management and Enabling Conditions for its Integration: Experiences from GTZ*, retrieved from: <http://www.transwaste.eu/file/001441.pdf>, June 2015
- Gunsilius, E., Chaturvedi, B. și Scheinberg A. (2011). *The Economics of the Informal Sector in Solid Waste Management*, retrieved from: <http://www.giz.de/de/downloads/giz2011-cwg-booklet-economicspects.pdf>, January 2015

- Gunsilius, E., Spies, S., García-Cortés, S., Medina, M., Dias, S., Scheinberg, A., Sabry, W., Abdel-Hady, N., Florisbela dos Santos, A.L., Ruiz, S. (2011). *Recovering resources, creating opportunities. Integrating the informal sector into solid waste management*, retrieved from: <http://www.giz.de/de/downloads/giz2011-en-recycling-partnerships-informal-sector-final-report.pdf>, May 2015
- Gutberlet, J. (2008). Empowering collective recycling initiatives: video documentation and action research with a recycling co-op in Brazil. *Resources, Conservation and Recycling* 52: 659-670
- International Labour Organization (2013). *Women and men in the informal economy: a statistical picture (second edition)*, retrieved from: [http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms\\_234413.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_234413.pdf), February 2015
- Katusiimeh, M.W., Burger, K. și Mol, A.P.J. (2013). Informal waste collection and its coexistence with the formal waste sector: the case of Kampala, Uganda. *Habitat International* 38: 1–9.
- Matter, A., Dietschi, M. și Zurbrügg, C. (2013). Improving the informal recycling sector through segregation of waste in the household: The case of Dhaka Bangladesh. *Habitat International* 38: 150–156
- Meagher, K. (2011). Informal Economies and Urban Governance in Nigeria: Popular empowerment or political exclusion? *African Studies Review* 54(2): 47–72
- Medina, M. (2005). Serving the Unserved: Informal Refuse Collection in Mexico. *Waste Management & Research* 23(5): 390-397
- Medina, M. (2007). *The World's Scavengers: Salvaging for Sustainable Consumption and Production*. AltaMira Press, Lanham
- Monirozzaman, S., Bari, Q. și Fukuhara, T. (2011). Recycling practises of solid waste in Khulna City, Bangladesh. *Journal of Solid Waste Technology and Management* 37: 1–15
- Nzeadibe, T. C. (2009). Solid waste reforms and informal recycling in Enugu urban area, Nigeria, *Habitat International*, 33(1): 93–99
- Nzeadibe, T.C. și Anyadike, R.N.C. (2012). Social participation in city governance and urban livelihoods: constraints to the informal recycling economy in Aba, Nigeria. *City, Culture and Society* 3(4): 313–325
- Nzeadibe, T.C. și Chukwuedozie, K.A. (2011). Development impact of advocacy initiatives in solid waste management in Nigeria. *Environment, Development and Sustainability* 13(1): 163-177
- Rockson, G.N.K., Kemausuor, F., Seassey, R., Yanful, E. (2013). Activities of scavengers and itinerant buyers in Greater Accra, Ghana, *Habitat International* 39: 148-155
- Sembiring, E. și Nitivattananon, V. (2010). Sustainable solid waste management towards an inclusive society: integration of the informal sector. *Resource, Conservation and Recycling* 54: 802–809
- Tellus Institute (2008). *Assessment of Materials Management Options for the Massachusetts Solid Waste Master Plan Review. Final Report*, retrieved from: <http://www.mass.gov/eea/docs/dep/recycle/priorities/tellusmmr.pdf>, October 2014
- TransWaste (2012). *Social effects of informal collection & formalisation strategies*. 8<sup>th</sup> period of the TransWaste project funded by Central Europe Programme, retrieved from: <http://www.transwaste.eu>, June 2015

HABITAT (2010). *Solid waste management in the world's cities. Water and sanitation in the world's cities 2010*, U.N. Habitat: Earthscan Publications

WIEGO (2014). *Informal Economy Monitoring Studies. The Urban Informal Workforce: Waste Pickers/Recyclers*, retrieved from: <http://wiego.org/sites/wiego.org/files/publications/files/IEMS-waste-picker-report.pdf>, May 2015

Wilson, D., Velis, C. Şi Cheeseman, C. (2006). Role of informal sector recycling in waste management in developing countries. *Habitat International* 30: 797–808

Zia, H., Devadas, V., Shukla, S. (2008). Assessing informal waste recycling in Kanpur City, India. *Management of Environmental Quality* 19: 597–612