Int. J. Econ. Environ. Geol. Vol. 10 (3) 50-55, 2019
Journal home page: www.econ-environ-geol.org

Open Access
ISSN: 2223-957X

An Economic Value of Waste for Informal Garbage Collectors and Community's Perception Regarding Environmental Sustainability; A Case Study of Faisalabad-Pakistan

Muhammad Ashfaq, Muhammad Hassan Mahboob, Sahar

Institute of Agricultural and Resource Economics, University of Agriculture, Faisalabad, Pakistan

*Email: m.hassan1695@gmail.com

Received: *21 June, 2019* ***Accepted:*** *17 September, 2019*

Abstract: This study analyzed economic value of solid waste for informal garbage collectors. It also evaluates community's perception for better environment. Although waste management and environmental sustainability is a worldwide problem, but Faisalabad's residents also face problems regarding solid waste, environment, clean water and clean air. The main objectives of this paper, which has been explored; to study the socio-economic characteristics of the respondents, to evaluates the resident's perception regarding better environment and also estimate the income level of garbage collectors and significant determinants of income which they generate through waste collection. Data were collected from 125 households and 125 informal garbage collectors from different parts of (7 districts) Faisalabad in the month of January and February 2019 through well-developed questionnaire. The results of the socio-economic characteristics of the respondents were drawn through SPSS and adult males, females having low level of education were in the majority in waste collectors. Five categories (Waste collectors, (W. Cs), call on scavengers (CSs), transfer point pickers (TPPs), Street pickers (SPs) and dumpsite pickers (DPs) were studied. They were generating reasonable income; most of them were generating income above 20,000 rupees per month by working on average 7 to 8 hours per day. The garbage was being collected from streets, households, institutions, factories, hospitals and markets through different instruments and sold to middle man or factories. Garbage collectors face many social problems like sexual harassment for female garbage collectors and chances of occurrence of diseases during their work much likely to happen. Informal garbage collectors were uneducated as compared to residents who give their perception regarding environment. Majority of the residents blamed themselves for poor management of solid waste which leads to low level of environmental sustainability. Lack of awareness of the residents was the critical factor for better environment. In the second part; Ordinary least square (OLS) method was used to check the impact of different factors affecting their income level. Working hours has significant impact on income level except others (gender, age and equipment of collection). The policy makers should increase the awareness among masses regarding the improvement of environment by better management. There should also be awareness program for garbage collectors regarding health hazards by involving NGOs and others volunteers.

Keywords: Solid waste, environmental sustainability, informal garbage collectors, Faisalabad.

Introduction

By the census of 2017, Faisalabad declared third most populous city of Pakistan, the population of Faisalabad is about 3.2 million, in which 19.84 percent population living below the poverty line. Faisalabad is the textile and industrial city of Pakistan, but most of the people still have no work to come out of themselves from the poverty trap. In every country of the world, solid waste management (SWM) and informal sectors play an important role in the waste collection and utilization of the waste in recycling. Commonly garbage collectors are looked down upon and they face abuses and insults. Although, 16,000 to 20,000 workers working under the Faisalabad waste management company (FWMC) besides informal sector. Waste collectors have some particular names in different countries, Catadores in Brazil, Cirujas in Argentina, scroungers or ravage pickers in English spoken countries and in India, mostly called waste pickers, but in Pakistan, they called in Urdu language (safai karne wali).

Garbage is the material, which produces from different individual's activities (Rana & Tariq, 2007), garbage is an inferior or undesired stuff or essence redundant by populace. Anything which is inferior and worthless is called garbage. Waste is any material which is redundant after main use or it is valueless out of order and of no utilize. Garbage in the broadest sagacity contains all the unnecessary materials from community, manufacturing and farming activities. For the duration of the 1st half of the 20th century, more than a few inaccessible studies were conducted on this concern. It was not in anticipation of the end of the 1950s, on the other hand, that waste administration and municipal cleanliness was critically addressed in rising countries. Garbage collectors collect the garbage in the form of (books, bags, rags, cardboards, plastic, lead, fabrics, bottles, iron, paper, glass, copper, tires and shoes etc.). The recent survey gives us information about all the garbage material which is used for recycling purpose. Kitchen waste like food waste material and paper/ cardboard material are available in more quantity for recyclable purposes. While plastic, glass and metal wastes are also top of the list for recycling. Informal or private Garbage collectors and recyclers generate income from garbage, not by keeping the environment better, but also decrease the

poverty and which is most important issue for developing countries.

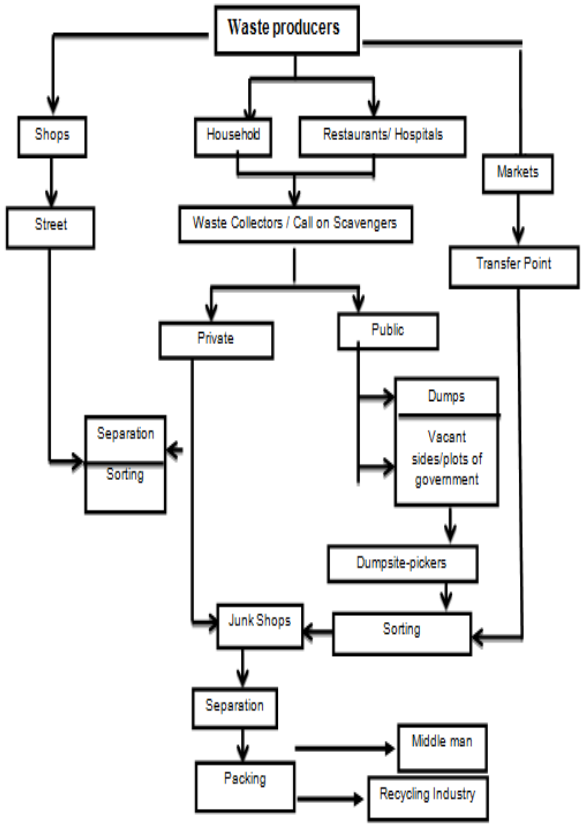

Fig. 1 Links between waste producers, garbage collectors and market channels of recyclable items.

Garbage collection gets through waste producers, like (households, poultry farms, meat shops, restaurants, markets, conventional disposal, educational institutions, industries, hospitals and from filth depots), some garbage collectors and recyclers earn less money but most of them earn marginally above the poverty line. The effort of informal sector for garbage collection and recycling is not given much importance and majority of the people do not acknowledge the advantages and contribution of this sector to health and environmental sustainability (Gutberlet et al., 2008). It is originating that garbage collectors and recyclers are adding together extra worth than their personal returns to leftover manufacturers' profits and to the saving of the town administration's expenses for ordering garbage. Garbage collection and recycling system uplift the community in orders of giving environment friendly conditions, but also encourage the community to extend their capacity (MISHR et al., 2004). Workers of the FWMC they just collect the garbage from households, markets; shops etc. and they trash it at dumps or landfill areas. Where they just waste the garbage, after that informal waste collectors collect the waste and they separate all the dusty or useless material from the waste. Garbage collections not only makes available a foundation of income to the poorer sections of the population, but also decreases the need for extremely complicated and expensive recuperation systems and upgrade their living standards. It is hypothetical that waste collection performs a fundamental role in budding the economic condition due to collection can get better. All the objectives can be attaining if government works with full attention, if not, people prefer society organizations, (Cheng et al., 2015). Figure 1 shows the involvement of garbage collectors till the recycling system. Almost 600 tonnes private sector collects the garbage from different areas of Faisalabad; on the other hand, FWMC worker's daily collection of waste is around about 1000 tonnes, so private sector role in garbage collection is much vital not only for them as source of income, it also important to the general cleanliness of the city. Over the last two decades, solid waste is a growing environmental and financial problem in Pakistan. Despite significant efforts in the last decades, the majority of municipalities in Pakistan cannot manage the growing volume of waste produced in their cities. The most successful initiatives occur where a mixture of public, private and community involvement has come into being, either through evolution or by deliberate design. Environmental sustainability in Pakistan has very low attentions throughout the years, in the conclusion of this low focus on garbage's management it been covered almost all cities of Pakistan especially Faisalabad. Municipal solid waste (MSW) management is a highly neglected factor of environmental management in all low and most middle-income countries (Murtaza and Rahman, 2000). Poorly managed waste streams are causing adverse environmental impacts and may result in health hazards (Misra et al., 2005). Environmental concerns are assuming ever-increasing importance in the MSW decision-making process (Elizabeth, 2014). Appropriate waste management strategies can substantially reduce the burden placed on the environment. If the waste management system is based on sound data and is well executed with public awareness, it can reduce emissions and resource depletion (Jurczak, 2003; Woodard & Cooper., 2004). Garbage collection is a difficult and complex task in Faisalabad. On the institutional level in Faisalabad are not fully responsible for the garbage collection for the purpose of environmental sustainability and recycling, most of the waste disposed in vacant areas.

The main objectives of this paper are; to study the socio-economic characteristics of respondents, to discuss the community's perception regarding environment and waste, garbage collector's health issues, working problems, and reasons of garbage collection, and to estimate economic value of waste.

Materials and Methods

Two questionnaires were finalized after the pre-testing, open ended and close ended questions format was used to improve the research categories. Two questionnaires were developed; one for local residents of Faisalabad to collect information regarding their perception about environmental issues due to waste and second

Table 1 Respondents socio-economic characteristics.

Categories of waste collectors	W.Cs	CSs	TPPs	SPs (29.60%)	DPs	Frequency	Percentage (%)
Gender							
Male	23	9	8	18	15	73	58.4
Female	11	9	4	19	9	52	41.6
Age level (years)							
1 – 15	2	1	-	3	-	6	4.8
16 – 30	13	1	4	10	5	33	26.4
31 – 45	10	6	8	14	11	49	39.2
Over 45	9	10	-	10	8	37	29.6
Marital status							
Single	11	1	4	11	4	31	24.8
Married	22	14	7	24	20	87	69.6
Divorced	1	3	1	2	-	7	5.6
Education (years)							
Primary	15	1	3	13	2	34	27.2
Other	2	1	-	1	4	8	6.4
No education	17	16	9	23	18	83	66.4
Income level (Rs)							
7000 – 15000	7	4	5	14	9	39	31.2
16000 – 24000	16	8	6	13	8	51	40.8
25000 or more	11	6	1	10	7	35	28
Housing							
Own	30	17	10	27	23	107	85.6
Rent	4	1	2	10	1	18	14.4
Religion							
Muslim	23	16	10	27	15	91	72.8
Non-Muslim	11	2	2	20	9	34	27.2

Note: *W.Cs= waste collectors, *CSs= call on scavengers, *TPPs= transfer point pickers,*SPs= street pickers, *DPs= dumpsite pickers;

questionnaire was developed for garbage collectors to collect the information regarding their attributes, health issues, working problems, work satisfaction, expenditures of garbage collectors, tools of garbage collection, their income level and savings. Questionnaires were developed in English, but interviews were conducted in local language Punjabi and Urdu. Data were collected in December (2018) and January (2019). A total sample of 250 respondents (125 local residents and 125 garbage collectors) were selected in this study, the simple random method was employed to get the respondents at road side, institution, homes, villages and at landfill areas. Case study was carried out in Faisalabad city of Pakistan; primary data were collected from 7 districts of Faisalabad. Ordinary least square (OLS) method was employed. Functional form of the model is given below (i). Descriptive analysis has been performed to provide over-view of socio-economic characteristics of respondents. For econometrics analysis MS Excel and SPSS have been used.

$$Y_i = B_{0+} \beta_1 D_{i+} \beta_2 X_{i+} \varepsilon_i \quad \text{(i)}$$

Where Y = income level (dependent variable),

β_i = Coefficient of determination, D_i = Gender (0, 1)

X_i = ‘’Independent variables (gender, age, working hours, equipment)

Results and Discussion

Garbage collectors’ categories are given below in (Table 1), where the categories are given, waste collectors, (W.Cs), call on scavengers (CSs), transfer point pickers (TPPs), Street pickers (SPs) and dumpsite pickers (DPs). Majority of the respondents (29.60%) are street pickers, Street pickers collect the garbage from streets, markets, and roads even dumps. Majority of the respondents were used donkey carts for the collection of garbage.

On the other hand, garbage collector’s socio-economic characteristics are given in (Table 1). The results show that more than half (58.4%) of respondents were male and (41.6%) were female. They were predominantly matured in age wise, (39.2%) of respondents were in the ranges of (31 to 46) years. Majority of the respondents were married (69.6%) and few were divorced. According to education level, (66.4%) respondents were uneducated and (27.2) percent only got the education up to primary level. Income levels of the respondents, (40.8%) respondents were fallen between the ranges of (16,000 to 24,000). Majority of the respondents had their own homes. (72.8%) respondents were Muslims**.**

Table 2 Average working hours, amount of collection and earning of income.

Categories of garbage collectors	Daily Average. working hours	Daily average. amount of collection (kg)	Monthly average. collection (kg)	Daily avg. Income (Rs)	Monthly average. Income (Rs)
Waste collector	8	240	240× 28=6720	810	810× 28=22680
Call on scavenger	7	280	280× 28=7840	845	845× 28=23800
Transfer point picker	6	200	200× 28=5600	650	650× 28=18200
Street picker	7	240	240× 28=6720	740	740× 28=20720
Dumpsite picker	7	200	200× 28=5600	725	725× 28=20300

Table 3 Garbage collector's health issues, working problems and work satisfaction.

Type of health issues	Frequency	Percentage (%)
Asthma	26	20.8
Tiredness	60	48
Skin	19	15.2
Depression	13	10.4
Headache	5	4
HIV/AIDS	2	1.6
Problems which collectors face the most during garbage collection		
Health	27	21.6
Injuries	22	17.6
Harassment	19	15.2
Weather	27	21.6
Jokes	7	5.6
Other	23	18.4
Work satisfaction		
Upward mobility	36	28.8
Stressful	28	22.4
Flexibility	61	48.8

Garbage collector's average daily working hours, average daily collection and average monthly income shown in (Table 2); waste collectors average working hours were higher than others and income level was also greater.

Table 4 Garbage collector's monthly expenditures and savings.

Garbage collectors	Expenditures = food, medical, shelter, clothing, utility bills education, electricity, house rent, maintenance of (cycle and carts) food for donkey	
	Average Amount of expenditures (Rs)	S = I – E
Waste collector	10791	22680 – 10791 = 11889
Call on scavenger	12919	23800 – 12919 = 10881
Transfer point picker	1127	18200 – 1127 = 17073
Street picker	1144	20720 – 1144 = 19576
Dumpsite picker	11106	20300 -11106 = 9194

S = * saving, I = * income, E = *expenditures

Garbage collectors face many health issues, majority of respondents (48%) feel tiredness during garbage collection and very few are also suffering HIV. Working problems regarding garbage collection, majority of the respondents (21.6%) told that weather condition affects them. An about half of the respondents felt flexible about this occupation (Table 3). Thakur et al., 2018 also showed various issues of health which garbage collectors face during waste collection. Which increased risk of injures in during their work, yet are poorly protected in relation to vaccine-preventable infections and work wear Black et al., 2019).

Garbage collector's expenditures and their savings are given below. Waste collector's expenditures are higher and savings too. Other garbage collector's expenditures and saving analysis are given below in (Table 4).

As results show that working hours is the only variable that having significant impact on income. As they work for more time, which increase their income. And other variables have no impact on income. Explanatory power of the model R^2 is 85.10%. F-stat value is also significant (Table 5).

Resident's socio-economic characteristics and their perception regarding environment shown in Table6 & 7 respectively, more than half (60%) of respondents were male and (40%) were female.

According to age, majority of the respondents (36.8%) were middle aged. Majority of the respondents were married (64.8%). Deliberately, educated people were targeted for data collection, majority of the respondents (48%) were got education at college level. According to their occupation, (42.4%) were government employed. Majority of the respondents were belonging to middle income class and high-income groups (49.6%) and (28.8) respectively.

As results show that, majority of respondents (80.8%)

Table 5 Results of OLS model.

Independent variables	B	Std. Deviation	Sign.
Gender (0,1)	120.24 ^{NS}	672.821	.858
Age	1.70^{NS}	21.983	.938
Working hours	14.10**	4.578	.003
Equipment	146.24^{NS}	239.377	.542
Intercept	4894.80	1279.377	.000
Sample size	125		
R^2	85.10%		
F –stat	118.79		

***ρ<0.05, **ρ<0.01, ***ρ<0.001, ρNS>0.05**

Table 6 Socio-economic characteristics of local residents.

Characteristics of local community	Frequency	Percentage (%)
Gender		
Male	75	60
Female	50	40
Age level (years)		
18 – 30	30	24
31 – 42	46	36.8
43 – 60	26	20.8
Over 60	23	18.4
Marital status		
Single	44	35.2
Married	81	64.8
Education level		
School	15	12
College	60	48
University	50	40
Occupation		
Student	26	20.8
Government servant	53	42.4
Self-employed/pensioners	27	21.6
Unemployed	19	15.2
Family Income level (Rs)		
Low (up to 50000)	27	21.6
Middle (up to 75000)	62	49.6
High (up to 100000)	36	28.8

indicated solid waste bring health issues in a community, only (4%) had opposite opinions. Majority of the respondents (48.8%) told that not only solid waste is the main reason other factors too. community's involvement could provide effective solid waste management (Khair et al., 2018).

Most of the respondents (87.2%) blamed themselves for environmental issues, but (4%) had no information due to low education. (48%) of respondents were not disturbed due to solid waste, they effected by clean water and (26.4%) were wanted all the facilities. More than half (70.4%) of the respondents were willing to help the garbage collectors in the form of money and (29.6%) respondents were willing but not in the form of money. A very high percentage of people showed their willing for government's project for better environment. According to Uzoma, 2017) affective management may improve environment.

Conclusion

Informal garbage collectors who worked in the Faisalabad were mostly males. They had their own residences; income level wasn't high but they were waste collectors by categories. Majored source of collection plays a vital role during their collection (donkey carts) and worked more hours excluding other garbage collectors, also facing in price mechanism issues during their sale. A garbage collector earns a healthy amount of income and expenditures were less than their income level. But they faced many problems including health and self-respect. Their health issues may reduce through community advancement programs (Cuyugan, 2017). Garbage collectors were facing health, social and economic adversity. Their role for environmental sustainability founded much crucial. Garbage collector's role is much vital in the role of environmental sustainability Montasser and Nakeeb (2017). Working hours was the only variable which had a significant impact on their income. On the other hand; residents facing many issues regarding environment and less involvement of formal sector towards rescue the garbage. Resident's education was concerned to environmental sustainability. Residents were male and middle aged; most of residents were students and belonged to high income class. Community's perception regarding environmental issues due to waste, they indicated that waste bring more health issues in the community and they blamed residents for this issue. Many of the residents were wanted clean water and clean air. Regarding their interest for better environment. Residents wanted better environment, so for that purpose they were willing to cooperate with government. Those living in better environment feel much happier (Rerkklang, 2018) Residents had positive attitude for the better environment.

Managerial Implications

Awareness regarding environmental sustainability is much needed in community for the current and future prospective. Government investment on environmental sustainability can be reduced if authorities make sure the involvement of residents. The policy makers should increase the awareness among masses regarding the improvements of environment by better management. A little investment on informal garbage collectors like, skills, education, and health can build a healthy environment. There should also be awareness program for garbage collectors regarding health hazards by involving NGOs and others volunteers. To garbage collectors should provide a better channel to sell out their daily waste on reasonable price. To provide better equipment to informal garbage collectors could collect heavy waste over the city. A

little attention to the informal garbage collectors can work efficiently and could reduce the load of government for environmental sustainability. Pricing system of waste should be authorized for garbage collectors.

References

Black, M., Karki, J., Lee, A. C. K., Makai, P., Baral, Y. R., Kritsotakis, E. I., Heckmann, A. F. (2019). The health risks of informal waste workers in the Kathmandu Valley: A cross-sectional survey. *Public health*, **166**, 10-18.

Cheng, Chao-yo, J. Urpelainen. (2015). Who should take the garbage out? Public opinion on waste management in Dar es Salaam, Tanzania. *Habitat International* **46**, 111-118.

Cuyugan, A. B. S., Agus, G. E., Dasig Jr., D. D. Nidea, M. A., Claricia, E. E., Taduyo, M. A. B., Camacho, E. J. (2017). In aid of community policy and framework development: A sustainable integrated community advancement program. *Journal of Advanced Research in Social Sciences and Humanities*, **2** (2), 87-95.

Elizabeth, A. (2014). Waste and Worldviews: Garbage and Pollution Challenges in Bhutan." *Journal for the Study of Religion, Nature and Culture* **8** (4), 405-428.

Gutberlet, Jutta, A. M. Baeder, (2008). Informal recycling and occupational health in Santo André, Brazil." *International Journal of Environmental Health Research* **18** (1), 1-15.

Jurczak, A. (2003). Samodzielna aktywność ruchowa młodzieży w czasie wolnym," *Wychowanie Fizyczne i Zdrowotne* 1.

Khair, H., Putri, C. N., Dalimunthe, R. A., Matsumoto, T. (2018, February). Examining of solid waste generation and community awareness between city center and suburban area in Medan City, Indonesia. *In IOP Conference Series: Materials Science and Engineering*, **309** (1). p. 012050. IOP Publishing.

Mishra, Pravakar, P. K. Mohanty, T. Sugimoto. (2004). "Environmental conditions and strategies for sustainable management of Chilika Lake, India. *In Asian And Pacific Coasts* 2003: (With CD-ROM), 1-14, 2004.

Misra, V., Pandey, S. D. (2005). Hazardous waste, impact on health and environment for development of better waste management strategies in future in India. *Environment international* **31** (3), 417-431.

Montasser, M. H. H., El-Nakeeb, I. (2017). Investigating solid waste supply chain: a proposed framework for achieving the environmental sustainability case study Alexandria, Egypt. *International Journal of Business and Economic Affairs*, **2** (3), 165-172.

Murtaza, G. Rahman, A. (2000). Solid waste management in Khulana City and a case study of a CBO: Amader Paribartan. Maqsood Sinha, AH Md., Enayetullah, I (Eds.), *Community Based Solid Waste Management*: The Asian Experience. Waste Concern, Dhaka, Bangladesh.

Rana, M. Tariq, (2007). Illuminating the silence: understanding the structure and function of small RNAs." *Nature reviews Molecular cell biology*, **8** (1), 23.

Rerkklang, P. (2018). Sustainability development consciousness and behavior of Thais: The effects on quality of life and happiness. *Journal of Advances in Humanities and Social Sciences*, **4** (1), 51-59

Thakur, P., Ganguly, R., Dhulia, A. (2018). Occupational Health Hazard exposure among municipal solid waste workers in Himachal Pradesh, India. *Waste management*, **78**, 483-489.

Uzoma, A. I. (2017). Approach to effective management of sustainable development in Nigeria. *International Journal of Business and Economic Affairs*, **2** (6), 346-355

Woodard, R. Cooper, (2004). Hardiness and the Concept of Courage: *Consulting Psychology Journal*: Practice and Research **56** (3), 173.