

Average Income and Repayment of Debt in a Society of Waste Pickers: The Case of Bantar Gebang in Indonesia

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With the rapid increase of waste generation in many developing countries, international donors and researchers have indicated the necessity of incorporating existing informal recycling systems into the operations of formal municipal solid waste management. This paper presents data related to 1) the average household income obtained from waste picking, 2) income sources other than waste picking, 3) repayment of debt to the boss in Bantar Gebang, West Java, Republic of Indonesia. Data were obtained from qualitative and quantitative field surveys conducted for a total of 808 days from February 2010 to January 2018. The average household income of a waste picker was USD 211.3. At least, six kinds of work associated with waste picking exist in the site. The total amount of debt repayments was within 20% of the total income. The average amount of saving was about 10% of the total income.

Keywords: waste picker, slum residence, informal recycling, income, Indonesia

1. Introduction

Informal waste recycling is one of the important income sources for the poor in both developed and developing countries. Recycling of municipal solid wastes in many developing countries relies largely on unorganized groups or individuals who collect recyclables from waste. As mentioned by Wilson et al. (2006), many urban poor in developing countries depend on waste recycling for their livelihoods. This phenomenon also exists developed countries such as Austria (Ramusch et al., 2015) and Canada (Gutberlet et al., 2009).

Studies on informal waste recovery and recycling have been carried out in many parts of the world: for example, Greece (Papaoikonomou et al., 2009), Austria (Ramusch et al., 2015), Cote d'Ivoire

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(Andrianisa & Brou, 2016), Nigeria (Agunwamba, 2003), Zimbabwe (Masocha, 2006), Tanzania (Kaseva & Gupta, 1996), Pakistan (Asim et al., 2012), India (Hayami et al., 2006), Vietnam (Mitchell, 2008), Indonesia (Sembiring and Nitivattananon, 2010), Philippines (Chua, 2017), Canada (Gutberlet et al., 2009), Mexico (Medina, 2005), Nicaragua (Hartmann, 2018), Brazil (Ghisolfi et al., 2017), Argentina (Parizeau, 2015), Chile (Navarrete-Hernandez & Navarrete-Hernandez, 2018), among others.

Although informal recycling has been researched in many places and from multiple viewpoints, there is still a need to provide further case studies to assess the potential of existing informal recycling system and to utilize its ability of collecting recyclables effectively in formal municipal solid waste management. The closed characteristic of the informal recyclers prevents a clear explanation of the details of their activities. Agunwamba (2003) pointed out that there was an air of secrecy around informal recyclers, perhaps bolstered by feelings of inferiority. Rouse (2006) mentioned that quantitative research was restricted mainly to determine the buying and selling prices of recyclable items. It is difficult and sometimes dangerous to perform research in these often-shunned communities (Nas and Jaffe, 2004). Due to concerns on security issues, unpleasant and hazardous conditions including odor, there are few data based on in-depth interviews by researchers in the field. In order to design policies that reflect the reality of informal recyclers, it is necessary to accumulate accurate in-depth data.

The objectives of this paper are to present (1) the average household income obtained from waste picking in Bantar Gebang, West Java province, Republic of Indonesia, (2) income sources other than waste picking, (3) repayment of debt to the boss.

2. Materials and Methods

2.1 Survey site description

A slum residence around the final disposal sites in Bekasi city, West Java province, was selected as the survey site. The Bantar Gebang final disposal site (about 108 ha) for solid waste generated in Jakarta and the adjacent Sumur Batu final disposal site (about 10 ha) for waste generated in Bekasi city, are located in Bantar Gebang of Bekasi city. Both of these final disposal sites are practically operated as open dumps, thus organic waste, plastics and metals are disposed without sorting or burning. The surrounding slum residence, formed mainly by on-site informal recyclers in private lands close to the final disposal sites, were selected as the survey site.

Almost all of the residents in the surrounding slum depend on waste picking at the final disposal sites for their livelihoods (Sasaki et al., 2014), and social relationships based on on-site informal recycling are formed in the field (Sasaki & Araki, 2013). The slum settlements surround the final disposal sites like a doughnut in privately owned land of four towns; Cikting Udik, Sumur Batu, Cikiwul, and Serang (Fig. 2). A total of 1,534 households live in the site (YDI, 2008) and of those, 97.2% of the heads of household are on-site informal recyclers (Sasaki et al., 2014) and more than 90% of on-site informal recyclers are waste pickers. The slum community is dependent on on-site informal recycling,

and at least eight types of social relationships have been formed based on managerial names identified in the survey (Sasaki & Araki, 2013).

2.2 Fieldwork

Data for this paper were obtained both from qualitative and quantitative surveys. Fieldwork was carried out 24 times for a total of 808 days during the period from February 2010 to January 2018 whereby the first author stayed in the slum residence and obtained data in the local Indonesian language.

General information on income and the way of work of residents were obtained by qualitative research. The lead author maintained his own dwelling in the slum and administered in-depth interviews with residents around his hut. Furthermore, non-structured interviews were carried out at several locations within the slum to obtain general information. For qualitative research, respondents to quantitative surveys were selected based on demographic composition.

2.3 Collecting pay slips and consecutive 14 days interviews

As presented by Sasaki et al. (2014), selling patterns by waste pickers in the site show two patterns: 1) sale on a daily basis; and 2) sale after a certain amount has accumulated named “*Nimbang*.” Data for pattern 1 were obtained through interviews on 14 consecutive days. Data for pattern 2 were derived from two pay slips for each recyclable: one for the most recent day before the 14-day interviews (first slip) and the other for the most recent after the start of the interviews (second slip). The number of days for collecting recyclables was calculated from the difference between the dates of the two slips. Income per day was calculated by dividing the income described on the second slip by the number of days.

2.4 Collecting and analyzing the ledger of Boss M

The ledgers of boss-M (not real name) were obtained and analyzed for revealing financial relationships between boss and followers. Information on the amount of debt repayment to the boss as well as the actual contents of dealing of recyclables is recorded in the pay slips issued to the waste pickers. Long-term information on these records is stored in ledgers kept by the bosses. The first author obtained these ledgers during the period 1 January to 30 June 2013 from Boss M, who dominated the area where the author’s hut was located. To confirm the accuracy of information obtained from the bosses, followers of Boss M were also interviewed.

To collect general information for the entire slum, the first author conducted interviews with other bosses without collecting their ledgers. As noted by Hayami et al. (2006), waste traders are known to be extremely cautious and are usually resistant to reveal details of their business dealings to outsiders. For this reason, the first author collected the ledgers only from Boss M and just interviewed other bosses without collecting the ledgers.

2.5 Estimation of daily income

The daily income for an individual or a household was estimated based on the data which were obtained by the continuous 14 days interview per household including weekends and holidays. The

total income for the period was divided by 14 to generate the daily income. Subsequently, the monthly income was calculated by multiplying the daily income by 30. The personal income was estimated by dividing the household income by the number of workers (waste pickers) in the household. It should be noted that it is not possible to grasp the exact amount earned by each member of the household by collecting recyclables, as the collected amount is often bundled together per household and sold for income which is then shared among members of the household. The number of waste pickers in a household was determined by interviewing each household. The exchange rate used in this paper is IDR 10,000=USD 1 taking into account the exchange-rate fluctuations and ease of calculation.

3. Overview of waste management in Indonesia

Previous studies on solid waste management in Indonesia were mainly performed in Java island (Chaerul et al., 2014; Damanhuri et al., 2006; Meidiana & Gamse, 2011; Pasang et al., 2007; Sasaki & Araki, 2013; Sembiring & Nitivattananon, 2010; Sicular, 1991; Supriyadi et al., 2000) and Bali island (MacRae, 2012; Zurbrügg et al., 2012; MacRae & Rodic, 2015), because the population density of Java island is the largest among all islands of Indonesia, and Bali island is famous in tourism worldwide. Previous studies with focus on informal recycling were performed in Bandung city (Sembiring & Nitivattananon, 2010; Sicular, 1991) and Bantar Gebang of Bekasi city, which is the research site in this paper.

As Waste Law No. 18/2008 was enacted in May 2008, waste management legislation in Indonesia has been improved considerably. There was no law on treating waste generated from households at the national level before 2008. According to Law No. 23/1997 on Environmental Management, waste is defined as the residue of a business and/or an activity, and the law did not mention municipal waste management (Chaerul et al., 2007). The Waste Law No. 18/2008 covers issues related to public service principles, waste management, an incentives and disincentives mechanism, funding schemes, shared responsibilities among waste authorities, private sector participation, community-based waste management and penalties for disobeying the law (Meidiana & Gamse, 2011). Subsequently, the Waste Law No. 81/2012 was enacted in October 2012 by the government of Indonesia to fulfill legal obligations required by the Waste Law No. 18/2008, and covers issues related to household and industrial waste.

Although the waste management laws have been developed, a lot of challenges remain in the implementation of municipal solid waste management. Pasang et al. (2007) pointed out six aspects on problems and constraints of municipal solid waste management in Indonesia: 1) Technical; 2) Institutional; 3) Financial; 4) Political; 5) Socio-economic; 6) Environment. As an example of these problems, Bantar Gebang final disposal site for waste generated in Jakarta has been designed as a sanitary landfill, but sanitary landfill activities are not being followed consistently; for example, soil cover may be applied only once every three weeks (Chaerul et al., 2007). It could be said that the existence of waste pickers itself represents the socio-economic problem pointed out by Pasang et al. (2007).

Informal recyclers play an important role in solid waste management in Indonesia, and activities of the informal recyclers are not considered illegal (Chaerul et al., 2014). Recycling is done mainly by the informal recyclers (Chaerul et al., 2014). President Suharto declared that scavengers, i.e., informal recyclers, were beneficial to the country's economy and environment (Medina, 2000). Since then, the government of Indonesia supported the formation of cooperatives of dumpsite and street waste pickers (Medina, 2000). It is hard to estimate the exact figure of the number of informal recyclers (Supriyadi et al., 2000). In 1992, it was estimated that there were at least 40,000 people involved in waste recycling in Jakarta (Anon, 1992).

4. Results and Discussion

4.1 The average household income obtained from waste picking

The average household income was USD 211.3. The figures in Table 1 are based on a total of 137 slips issued to eight households for the period between 1 January and 30 June 2013. The debts incurred by respondents through loans from other sources such as banks were not considered in this study, since they are often not directly attributed to their daily living expenses, such as on the occasion of childbirth or buying a motorcycle. The household income shown in Table 1 is the income recorded in pay slips, which is earned from the recyclables that are sold after being accumulated to a certain amount and does not include the income earned on a daily basis. Based on the data of 51 households surveyed in 2013, the waste pickers earned an average of USD 22.7 from their daily dealings. Therefore, an additional USD 120 for the six months period or USD 20 per month should be added to reflect the true figure.

4.2 Income sources other than waste picking

There are diverse sources of income associated with waste picking in the slum residence, and work

Table 1. Income and repayment of debt to the boss.

No.	Six months total						Average per month				
	Receiving		Repayment		Deposit		Income* ¹	Receiving	Repayment	Deposit	Income* ¹
	Amount	Percentage	Amount	Percentage	Amount	Percentage					
(USD)	(%)	(USD)	(%)	(USD)	(%)	(USD)	(USD)	(USD)	(USD)	(USD)	
1	1124.0	68.3	285.0	17.3	236.8	14.4	1645.8	187.3	47.5	39.5	274.3
2	1108.7	80.2	214.5	15.5	60.0	4.3	1383.2	184.8	35.8	10.0	230.5
3	1161.8	89.6	10.0	0.8	125.4	9.7	1297.2	193.6	1.7	20.9	216.2
4	1056.8	76.7	23.0	1.7	297.6	21.6	1377.3	176.1	3.8	49.6	229.6
5	772.8	73.0	206.0	19.5	80.0	7.6	1058.8	128.8	34.3	13.3	176.5
6	813.8	78.4	130.0	12.5	93.8	9.0	1037.6	135.6	21.7	15.6	172.9
7	697.8	95.9	30.0	4.1	0.0	0.0	727.8	116.3	5.0	0.0	121.3
8	465.7	74.2	88.0	14.0	74.1	11.8	627.8	77.6	14.7	12.4	104.6
Average income by nimbang											190.7
Average income including daily dealing											211.3

Note. *¹ Not include daily dealing.

Table 2. Income sources other than waste picking

Payment unit	No.	Job description	Wage (USD)	
			Amount	Unit
Diem basis	1	All tasks except for waste picking	5 per Day	
	2	Loading recyclables and/or waste (if heavy)	7.5 per truck	
Commissions	3	Loading recyclables and/or waste (if not heavy)	5 per truck	
	4	Sorting of recyclables	0.15 per kg	
Quoting price	5	Driving a truck	—	—
	6	Loading recyclables	—	—

Note. Data obtained by field survey. Especially No. 1 to No. 3 was obtained by the field survey in June 2013 and No. 4 was obtained from pay slips of May 2013 between boss and followers.

contents and earning of these various sources are listed in Table 2. Occupations derived from waste picking include sorting and packing (Sasaki & Araki, 2013). Sorting of recyclables is conducted both as domestic work for family members and wage labor for sorting the recyclables owned by the bosses as indicated in No. 4 in Table 2.

There are three methods of payment related to waste picking. The first is per diem basis as indicated in No. 1. Work contents of No. 1 contain those of items No. 2 to No. 6 and are not fixed. The second is commissions and applies to No. 2 to No. 4. Wage laborers are employed for each work and paid a fixed fee. The third is by quoting prices which is applied to No. 5 and No. 6. These works are sporadic work that bosses occasionally order as needed.

Residents in the slums were often unwilling to engage in the types of work listed in Table 2 even when the work did not require specific professional skills and they could possibly earn much more income than regular waste picking. Work No. 1 and No. 2 were unpopular, as laborers needed to work for a fixed time frame such as 9:00 to 17:00 every day except for weekends in order to gain a stable income as per diem wage. Work No. 3 was particularly unpopular, as it involved lifting heavy materials to receive the high income. Work No. 4 is not physically demanding and therefore the wage is particularly low. The average income of work No. 4 was USD 49.3; the standard deviation was USD 28.1, and the median was USD 28.1. Women, who had spouses that were the primary breadwinners, constituted the majority for this work. Only a limited number of people could engage in work No. 5 since it required driving a truck as part of its duties.

4.3 Repayment of debt to the boss

Bosses function also as a bank for their followers. Followers can borrow money from bosses, or deposit savings from the proceeds of selling of recyclables to the boss. There is no interest in both debt and deposit. The typical followers borrow money from their boss for compensating for the lack of the income for living expenses and the unexpected expenses such as medical expenses. On the contrary, many followers also deposit money from the sales of recyclables to their boss as a saving in order to prepare money for returning to the hometown or to restrain excessive spending.

The total amount of debt repayments was within 20% of the total income (Table 1). The highest percentage was 19.5% of household No. 3, which is 18.0% if also the income from the dealings on a daily basis was considered. The average percentage of debt repayments of households No. 1 to No. 5 whose repayment rate was more than 10% was 15.8%, which can be translated as 14.2% when income from the daily dealings were considered. The average debt repayment for all respondents was USD 20.6 per month.

The average amount of saving was about 10% of the total income (Table 1). The highest percentage was 21.6% of household No. 4, which is 17.5% if also the income from the dealings on a daily basis was considered. The average percentage of saving of households excluding No. 4 (21.6%) and No. 7 (0.0%) whose saving rate was 9.5%, which can be translated as 9.3% when income from the daily dealings were considered. The average saving for all respondents was USD 20.2 per month.

It could be estimated that waste pickers spend 80% of the total income for living cost. Total income and repayment of debt were different depending on waste pickers. The percentage of received cash compared to the actual sales of recyclables widely differed from 68.3% of No. 1 to 95.9% of No. 7 in Table 1. The average amount of received cash was USD 150.0, which occupied 79.5% (SD: 9.1) of the total sales: besides, if the income from daily dealing (see 2.2 is considered, the average amount was USD 172.7, and the percentage was 81.8 (SD: 8.2).

Although only the data of live-in waste pickers were presented in this paper, it is most likely that a part of live-out followers borrow money from bosses or deposit savings because these transactions between live-out followers and the boss were registered in the ledger of Boss M. Only the data that the authors could confirm from both the boss and followers were used for the analyzing in this paper. For this, we do not present the data on the case of live-out waste pickers.

5. Conclusion

The average household income was USD 211.3. At least, six kinds of work associated with waste picking exist in the site. The total amount of debt repayments was within 20% of the total income. The average amount of saving was about 10% of the total income. One of the challenges for the future is to investigate the feasibility of integrating on-site informal recycling into formal waste management. The good methods of collaboration between on-site informal recyclers and municipal waste management should be further discussed.

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