

ACHIEVING SUSTAINABLE LIVELIHOOD THROUGH SOLID WASTE MANAGEMENT IN DHAKA CITY

Mehe Zebunnesa Rahman¹, Chamhuri Siwar^{2*} and Rawshan Ara Begum³

¹ School of Business Studies, Southeast University, Bangladesh.

²Institute for Environment and Development, ³Institute of Climate Change, National University of Malaysia

*Corresponding Author; Received: 18 June 2016; Revised: 3 August 2016; Accepted: 14 August 2016

ABSTRACT: Solid waste management (SWM) has become an enormous burden for the governments of developing countries. SWM is a particularly crucial problem in the Dhaka, the capital city of Bangladesh. The Dhaka City Corporation (DCC) is the only formal organisation responsible for waste management. It estimates that up to 2% of the population of developing countries survive through informal waste-recovery activities. Thus, this study is aimed to assess the sustainable livelihood through SWM among the waste workers in Dhaka. This study collects primary data through a questionnaire survey on 436 poor waste workers living in the Dhaka city of Bangladesh. The samples are selected from the landfill, commercial and residential area based on the stratified random sampling technique. This study shows that the analysis of structural equation modelling achieves the required level of validity, reliability and fitness where the values of Cronbach's alpha (α) > 0.7; Construct Reliability (CR) > 0.6; Average Variance Extracted (AVE) > 0.5; Chi-square, Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) > 0.90; Root Mean Square of Error Approximation (RMSEA) < 0.08 and chi Square / Degree of Freedom (Chisq/df) < 5. The three latent exogenous constructs namely source separation, health hazards, and sustainable livelihood are significant variables to achieve sustainable livelihood vis-à-vis poverty reduction. Using the econometric model, the study focused on the health awareness, welfare, income generation, employment opportunities of waste workers.

Keywords : Sustainable Livelihood, Source Separation, Solid Waste Management, Dhaka City Corporation

1. INTRODUCTION

Bangladesh is the eighth largest population in the world and the twelfth most densely populated country. Inadequately planned, haphazard urbanization, along with industrial and commercial activities contribute to the substantial quantity of waste produced in Bangladesh. Dhaka, the capital city of Bangladesh had strong economic growth from 2001 to 2011. Although waste can be considered as "unrecovered wealth", it still remains a major concern in Bangladesh. This would imply that millions of people are involved in some kind of waste picking. The objective of this paper is to examine the factors that affect the poverty reduction and achieving a sustainable livelihood among the waste workers in Dhaka, Bangladesh.

It is one of the most densely populated urban areas in the world. The population density of Dhaka is calculated at 50,368 people per square mile or 19,447 people per square kilometer, (Table 1) with a total population of 16 million with a population growth of 6% per year.

Urban solid waste management is considered one of the most critical environmental problems in developing countries, including Dhaka, Bangladesh. By the end of 2015, Dhaka is expected to produce 4600 tons or more waste per day [27]. Reference no [11] states that which is a 47% increase from the year 2004 when the waste level was at 3,400 tons per

day. Pollution and the ceaselessly unmanaged flow of waste contribute to the disruption and destruction of the environment. This also contributes to unhygienic living conditions, which worsens the situation for unsheltered people who live in extreme poverty. Usually local governments in developing countries are responsible for waste management, but they are facing serious problems in dealing with large volumes and quantities of waste produced due to their lack of finance and other logistic capabilities stated by reference [28]. This research is an attempt to estimate poverty reduction and sustainable livelihood by the proper SWM. In this case, the economic and environmental benefits would help to understand the role of waste workers in the solid waste management e.g. particularly its role in economic development, social well-being and environmental protection which is vital to further develop strategies for Dhaka city. It is a comparatively new approach developed to address the failure of previous attempts in community development. Since the establishment of sustainable solid waste management, significant proportion of existing literatures had focused mainly on recycling, waste collection, disposal, willingness to invest and clean development programmes.

Rapid population growth in urban areas and the rise of income are the factors for enhanced waste

production. The government's capacity to manage this waste is inadequate. Insufficient tax revenue, poor tax enforcement of the current waste regulation framework, weak inter-agency coordination, as well as the declining capacity of waste management in the city are all affecting factors. Dhaka has undergone several severe effects such as a high permeation of diseases, ground water contamination, and appalling air quality.

The Economic and Social Council of the United Nations developed three criteria that are utilized to determine the countries which belong to the group of the least developed country (LDC) namely: i) an estimate of a three-year average of the per capita gross domestic product (GDP). This figure must be lower than \$992 for the nation to be counted as being in the LDC group, and more than \$1,190 to come out of that group; ii) an unskilled human resource criterion, that includes the Augmented Physical Quality of Life Index (APQLI), in terms of such as indicators:- nutrition, education, health, and adult literacy; and iii) the economic vulnerability criterion that includes the Economic vulnerability

index (EVI) in terms of indicators such as agricultural production instability, unstable exports of goods and services, the economic significance of non-traditional activities (share of modern services and manufacturing in the GDP), concentration on export of merchandise and the incapability of a small economy. Bangladesh has fulfilled all the above criteria. Currently 48 countries are under the LDC status: 34 from Africa, 9 from Asia (including Bangladesh), 4 from Oceania and 1 from the Americas United Nation [42]. The LDCs contribute the least to the greenhouse gas emissions however they are the most vulnerable countries to the effects of climate change, as well as have the least potential for adapting to these changes. They are prone to suffer from the potential increase in natural disasters such as droughts and floods caused by climate changes. The LDCs have neither the adequate financial, institutional, and economic capability to manage the impacts of climate change nor the ability re-develop their infrastructures if they are destroyed by natural disasters [43].

Table 1. World wide Urban Population

	Country	City	Estimation of Pop ⁿ	Land Area in Sq km	Population Density	Land Area in sq	Population Density
1	Japan	Tokyo-Yokohama	37,126,000	8,547	4,300	3,300	11,300
2	Indonesia	Jakarta	26,063,000	2,784	9,400	1,075	24,200
3	South Korea	Seoul-Incheon	22,547,000	2,163	10,400	835	27,000
4	India	Delhi, DL-HR-UP	22,242,000	1,943	11,500	750	29,700
5	Philippine	Manila	21,951,000	1,425	15,400	550	39,900
6	China	Shanghai, SHG	20,860,000	3,497	6,000	1,350	15,500
7	United States	New York, NY-NJ-CT	20,464,000	11,642	1,800	4,495	4,600
8	Brazil	Sao Paulo	20,186,000	3,173	6,400	1,225	16,500
9	Mexico	Mexico City	19,463,000	2,046	9,500	790	24,600
10	Egypt	Cairo	17,816,000	1,709	10,400	660	27,000
11	China	Beijing, BJ	17,311,000	3,497	5,000	1,350	12,800
12	Japan	Osaka-Kobe-Kyoto	17,011,000	3,212	5,300	1,240	13,700
13	India	Mumbai, MAH	16,910,000	546	30,900	211	80,10
14	China	Guangzhou-Foshan, GD	16,827,000	3,173	5,300	1,225	13,700
15	Russia	Moscow	15,512,000	4,403	3,500	1,700	9,100
16	Bangladesh	Dhaka	15,414,000	347	44,400	134	115,000
17	United States	Los Angeles, CA	14,900,000	6,299	2,400	2,432	6,1000
18	India	Kolkata, WB	14,374,000	1,204	11,900	465	30,900
19	Pakistan	Karachi	14,198,000	777	18,300	300	47,300
20	Argentina	Buenos Aires	13,639,000	2,642	5,200	1,020	13,400
21	Turkey	Istanbul	13,576,000	1,399	9,700	540	25,100
22	Brazil	Rio de Janeiro	12,043,000	2,020	6,000	780	15,400
23	China	Shenzhen, GD	11,885,000	1,748	6,800	675	17,600
24	Nigeria	Lagos	11,547,000	907	12,700	350	33,000
25	France	Paris	10,755,000	2,844	3,800	1,098	9,800
26	Japan	Nagoya	10,027,000	3,820	2,600	1,475	6,800

Note: (Over 10,000,000 Population)

Source: 2012 Worldwide Population and Density in Urban Area

2.LITERATURE REVIEW

Respondents are positively willing to pay for new solid waste management programs. It includes waste minimization and recycling options in Dhaka which is economically viable as well. The factors are necessary to effectively improve waste management, growth, and performance, as well as to reduce the environmental degradation of the household waste but they didn't focus on financial, economical, livelihood patterns [23]. Livelihood encompasses abilities, assets (resources, stores, access and claims) as well as activities involved in daily living; a sustainable livelihood is one that is able to cope with and recover from shocks and stress, enhance or maintain its level of capabilities and assets, and offer sustainable opportunities of livelihood to the next generation, and which provides net benefits to other livelihoods at the local and global levels in the short and long terms.

The practical implications of this paper, when it considers the strategies managers can be used for dealing with the problem of consumers losing loyalty in the brands and turning to counterfeits. The paper contributes to inform policy makers and managers of brands about the main predictors of consumer's attitudes toward counterfeits. Source separation promotes the removal of all designated recyclable materials from the waste stream and, therefore helps in achieving high reduction rates. Source separation creates clean and saleable materials by reducing the extent of contamination.

Researcher [24] reveals that the waste management system consists of classified collections, centralised treatment, and decentralised treatment. It is important to ensure financial viability and practical considerations of this system. The results of the rural area of Southwest China indicated that the generation of domestic waste was 178 g d⁻¹ per capita and it was mainly composed of kitchen waste, inert waste, plastics, and paper with a total proportion of 81.98% but it have shown that waste composition is mainly based on locality, environmental activities, and income.

The study aimed at using the function of SEM which exceeds multiple regression. An incremental technique to SEM was also established to show the testing of a model of training transfer. This model was utilized to compare the SEM functions and multiple regression in the model testing and development. Three relationships were observed and a best fitting model was established. SEM assists in developing a new relation based on the modification indexes, which was accepted theoretically [4].

This study explains the precise methodology for an economic, operational, and environmental evaluation of municipal solid waste collection in the Portuguese city of Porto. The suggested methodology for MSW collection performance

assessment is a beneficial tool for simultaneous economic, operational, and environmental evaluation. However, it did not focus on sustainability [37].

The findings explain strong support for the mitigating function of managerial actions via the process of strategy-making and indicate that this is true for all small-to-medium- enterprise (SME) sizes.

The main limitation in this study is that the survey was carried out in mid-western USA and involved only the SME manufacturing organizations. The research should be extended to other geographic regions, industry types, and larger organizations.[36].

Poorly managed, unsuitable healthcare and waste management systems can also create adverse impacts on human health and on the environment Researchers [35] offers a general view of the present status of toxic and hazardous waste management in Botswana.It also points out the key challenges of toxic and hazardous waste management. This study suggests the best applicable strategies to reach a successful and effective toxic and hazardous waste management system in the future.Public-private partnership is essential nationally and internationally to gain management for environmentally toxic and hazardous waste.

Researchers [46] investigates the effectiveness of poverty reduction projects and the reasons for the failure and success. It was found that programmes and projects should be built based on the full knowledge and awareness of all stakeholders. Dynamic collaborative environmental knowledge can assist in achieving this. Knowledge creation is an essential prerequisite for successful poverty alleviation. Experience shows that it is indeed possible to make successful poverty alleviation interventions. It has to be comprehensive, people-centric, and concentrated on actions and learning if it is to be successful. However, in this research, it has emphasized on not only knowledge but also on cooperation, technical expertise, and experience.

In Malaysia, there are four kinds of scavengers who deal with recycling. Several factors affect the recycling activities and the productivity. Price of recyclable items, traders' behaviour, regulations, and diseases and infection have been observed [25] Part time and full time scavengers' contribution to the recycling sector is quite different. Thus, research is required to seek out the means to guide and educate the scavengers properly, covered the area of SWM being a formidable challenge in Malaysia. The fast growth rate of industries and vast development are the key reasons for the large quantities of solid waste.

3. METHODOLOGY

This research provides the empirical evidence for answering this question by estimating a Structural Equation Model (SEM) using primary data gathered within Dhaka, the capital city of Bangladesh. Structural Equation Modeling (SEM) is among the most advanced statistical analysis techniques that emerged in recent decades [10]. The theoretical framework shows the dependent construct is sustainable livelihood, and the independent constructs are source separation and health hazards. These constructs are selected in light of prior researches on the determinants of engagement in Livelihood. The study intends to test the following three hypotheses as shown in Figure 1.

H1: Health Hazards factor has significant and direct effects on sustainable livelihood.

H2: Source separation has significant and direct effects on sustainable livelihood.

SEM is a class of multivariate techniques that combine aspects of factor analysis and regression, enabling the researchers to simultaneously examine relationships among latent constructs. SEM is one of the most prominent statistical analysis techniques today [10].

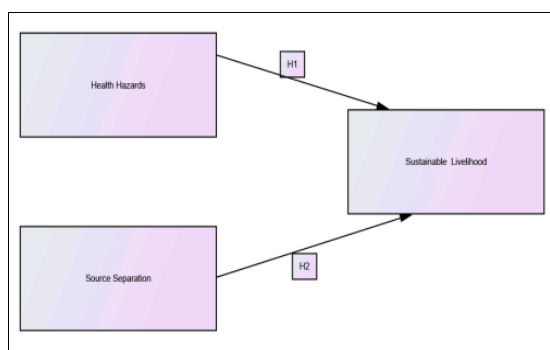


Fig. 1 Theoretical Framework

Particular interest is on the question whether some of the factors namely source separation, health hazards, are actively play a role in reducing the possibility of being poor. This issue is particularly significant since it has been addressed in various relevant literature. There is potential for the waste picking sector to play an important role in alleviating poverty of the waste workers. Framing policy to develop skilled waste workers could be an effective strategy towards implementing a sustainable waste management system in Bangladesh. This study employed self-administered questionnaire for data collection. Respondents could attend them at their own convenient time without pressure or favor from any quarters [20]. The structured questionnaire and stratified random sampling were designed to

measure all constructs involved in the theoretical framework. A total of 436 respondents were selected from two urban areas in Dhaka city, namely Dhaka North City and Dhaka South City. It is to be mentioned that Dhaka city has been divided into two administrative corporations, namely Dhaka North City Corporation (DNCC) and Dhaka South City Corporation (DSCC) under the local government (City Corporation) amendment act 2011. One of the study areas is the largest government approved sanitary landfill located at Matuail in DSCC, with another located in DNCC. These areas are chosen based on the availability of waste workers. There were three possible methods for the survey: face-to-face interview, telephone interview, or mail ([33]. A survey can be conducted by mail [34] or by some combination of mail and personal interview [13]. Among these methods, this study chose the face-to-face interviews, because the quality of the data obtained by this method has been found to be the most complete, comprehensive, and meaningful. All the responses were measured on a 10-point "Likert" scale with 1 = Strongly Disagree and 10 = Strongly Agree. Structural Equation Modeling (SEM) is the second generation statistical method widely employed by researchers nowadays to analyze the inter-relationships among variables simultaneously in a model. The general SEM model is composed of two sub-models: a measurement model and a structural model. The most popular estimation technique for SEM, which is the Maximum Likelihood (ML) estimation, uses the assumption that the following conditions are addressed: i) the sample is very large; ii) the distribution of the observed variables' multivariate is normal; iii) the hypothesized model is valid; and iv) the scale of the observed variables is continuous. The study's data were verified to address these conditions; as such the ML method was utilized to estimate the model and the parameters. The Confirmatory Factor Analysis (CFA) is a specialized form of factor analysis. It is used to examine if the measurements of a construct are consistent with the researcher's comprehension of the construct's nature. The CFA technique replaced older approaches in determining the construct's validity. The two ways of using the CFA for the measurement model include the CFA for the individual model and the CFA for the pooled measurement model. A confirmatory factor analysis was carried out to confirm the underlying structure of the constructs or domains for the items and to define a workable set of items. The identified and selected items were analyzed to decide if they converge to the domains to which they were specified. Factors with *Eigen* values of more than one are regarded as significant and utilized for further analysis in this study. [10] suggested that items with factor loadings of at least 0.50 are significant. Nevertheless, loadings of at least 0.40 are regarded as important, and when the sample size

is more than 200, they are also regarded as significant [9]. The scale features good psychometric indices of consistency, high reliability, and validity. Reference [9] suggested that in the index of reliability, the lower limit is .70; however, this can be lowered to .60 for exploratory study purposes. The number of scale points in the questionnaires has been an area of much debate.

4. RESULTS AND DISCUSSION

4.1 Descriptive statistics

Out of the 440 questionnaires distributed to waste workers, 436 were completed and used for analysis. Out of the 440 respondents, 284 (64%) were male and 152 (36%) were female. Most of the respondents hold a non-professional while the rest have primary degree. A majority of them have experience below 3 years.

There are five types of waste pickers/workers who are officially recognized in Bangladesh [11]. The model was empirically tested using Structural Equation Modelling (SEM) (AMOS version 21) with maximum likelihood estimation [6,32]. The study has also followed the two-stage model-building process for applying SEM as suggested by [10]. There are 2 types of SEM analysis, the first one being covariance based SEM and the second one being variance based, which is called partial least squares (PLS). The choice is driven by whether the purpose is to test a theory or whether it is more exploratory in nature. Since the purpose is to test the factors affecting the achievement of a sustainable livelihood, along with poverty eradication in the long term, covariance based SEM has been chosen. As suggested by [10] four decision criteria were used in evaluating the results generated from measurement models: internal consistency (composite reliability), indicator reliability, convergent validity (average variance extracted-AVE) and discriminant validity. Convergent validity was assessed based on factor loading, composite reliability, and variance extracted [6].

The factor loading for all items in this study exceeded the recommended level of 0.6 [4]. Root Mean Square Error Approximation (RMSEA) values less than 0.05 indicate good fit. The values larger than 0.10 are indicative of a poor fit. RMSEA values ranging from 0.05 to 0.08 indicate fair fit. The values ranging from 0.08 to 0.10 are indicative of mediocre fit. In my research I have received .07 RMSEA which indicates very good fit. Composite reliability which depicts the degree to which the construct indicators indicate the latent construct, ranged from 0.770 to 0.875 exceeding the recommended level of 0.7 which was suggested by [7]. In the data mining process, all skewness values

lie between -1.0 and 1.0, and is considered normally distributed and acceptable to proceed with the parametric analysis procedure. [20] Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy if the seven variables is close to 1.0. These KMO values exceed the recommended value of 0.6 [12] and this suggests that the data is appropriate to proceed with data reduction procedure (Table 2).

As indicated in the analysis section, the results of this study were generated and confirmed at three successive stages, a) Pre test, b) Pilot test and c) field survey. Exploratory factor analysis (EFA) is recommended for use in pilot study whereas Confirmatory factor analysis (CFA) is used in final field survey. The values of composite reliability for all constructs were above 0.80 which are sufficiently higher than the threshold value (0.60). The AVE values were also satisfactory, as they exceed the minimum accepted level of 0.50 for all construct in measurement mode.

4.2 Reliability Test

Reliability level for each variable was determined using Cronbach's Alpha. The alpha value for each variable exceeded 0.7 and this is considered acceptable for further analysis.

4.3 Structural Equation Modelling (SEM)

Structural Equation Modelling using AMOS 22.0 confirmed two important findings

1. There is a significant relationship between health hazards and sustainable livelihood.
2. There is a significant relationship between source separation and sustainable livelihood

Finally, Structural equation modelling (SEM) has been placed with latent variables, source separation, health hazards and dependent variable is achieving sustainable livelihood (SLV) along with poverty reduction. Results showed that the factors source segregation, (motivation to do work properly) and health hazards were positively significant (Table 4).

The regression coefficient of health hazard on sustainable livelihood, health ($p = 0.003$) in Table 4 is also a significant predictor of sustainable livelihood. The probability of getting a critical ratio as large as 4.189 in absolute value is less than 0.001. In other words, the regression weight for health hazards in the prediction of enhance through education is significantly different from zero at the 0.001 level (two-tailed). These statements are approximately correct for large samples under suitable assumptions. It is also found that the regression coefficient of source segregation, health hazards on sustainable livelihood are (p value = .000 and .003) respectively in Table 4.

Table 2: Fitness Index

Name of category	Name of index	Index full name	literature	Level of acceptance	comments
1. Absolute fit	Chi-square	Discrepancy chi square	Wheaton et.al (1977)	$P > 0.05$	Sensitive to sample size >200
	RMSEA	Root Mean Square of Error Approximation	Browne and Sorbom (1984)	RMSEA < 0.08	Range 0.05 to .1 acceptable
	GFI	Goodness of Fit Index	Joreskog and Sorbom (1984)	GFI > 0.90	GFI= 0.95 is a good fit
2. Incremental fit	AGFI	Adjusted Goodness of Fit	Tanaka and Huba(1985)	AGFI > 0.90	AGFI= 0.95 is a good fit
	CFI	Comparative Fit Index	Bentler (1990)	CFI > 0.90	CFI= 0.95 is a good fit
	TLI	Tucker-Lewis Index	Bentler and Bonett(1980)	TLI > 0.90	TLI= 0.95 is a good fit
	NFI	Normed Fit Index	Bollen (1989b)	NFI > 0.90	NFI=0.95 is a good fit
3. Parsimonious fit	Chisq/df	Chi Square / Degree of Freedom	Marsh and Hocevar(1985)	Chi square/df < 5.0	The value should be less than 5.0

Source: *** one could ignore the absolute fit index of minimum discrepancy chi-square if the sample size obtained for the study is greater than 200 (Hair et al 1996, Joreskog and Sorbom , 1996) (Zainudin 2015)

Table 3. Cronbach and items with variable

Variables	No of items	Cronbach
Source separations	5	0.887
Sustainable livelihood	4	0.946
Health hazards	3	0.870

It mean that these are significant predictor on sustainable livelihoodof waste workers. The findings of this study imply that promoting organized and systematic waste management activities, such as intensifying urban industrialization with formal sector, will have a positive impact on efforts of the nation to reduce poverty.

4.4 Correlation

Correlation test was conducted to test the correlation of each independent variable (namely source separation and health hazards) with sustainable livelihood. Two variables with the highest correlation value are health hazards and source separation are (0.596), which is <0.85 .(Fig 2). This indicates that there is no multicollinearity problem. Thus, this research decided to focus on these variables for further analysis.

SEM is a confirmatory method providing a comprehensive means for validating the measurement model of latent constructs. The validating procedure is called Confirmatory Factor Analysis (CFA) [19] The CFA method has the ability to assess the Unidimensionality, Validity and Reliability of a latent construct. The researcher could run the CFA for the every measurement model or using a pooled CFA[20] That's why the

researcher confirmed the unidimensionality , validity and reliability for the all constructs involved before modelling their inter relationship in a structural model. Index category and the level of acceptance for every index.

Systematic source separation happens to be an important element in many successful waste management systems that facilitate efficient financial management through minimum energy and labour inputs in the downstream process by [43][38] [40].Waste separation at source is very important in the 3R initiative. Municipal waste given its diverse sources will contain a combination of materials. Nevertheless, of late, it has been observed that recyclables with economic value such as wastepaper, plastic, broken glass, metal, etc., are not segregated and are thrown out on the streets by people along with domestic/trade/institutional waste. Source separation enhances the operational hours.

The Sustainable Livelihood (SL) concept is one that goes beyond the traditional definitions and methods of poverty eradication. Waste working can be viewed as an entrepreneurial function which offers the disadvantaged with a livelihood, contributes to the local economy, and promotes recycling. It has been observed that any large city facing rapid growth of population would understandably face many challenges [41] [38] More recently, the British Department for International Development (DFID) and the Institute for Development Studies (IDS) have been operationalizing the SL concept and approach. Leading advocate, Ian Scoones of the IDS, suggested a modified definition of SL which suggested that while the challenges in effective adoption of alternative livelihoods at the local and community levels could be overcome, creating the enabling environments at the national scale required direct and integrated policies [22].

Table 4: Regression Weight

Items						Estimate	S.E.	C.R.	P	Result
Sustainable worker	livelihood	of	waste	<---	Source Separation	0.432	0.062	6.993	***	Significant
Sustainable worker	livelihood	of	waste	<---	Health hazards	.181	.061	2.965	.003	Significant

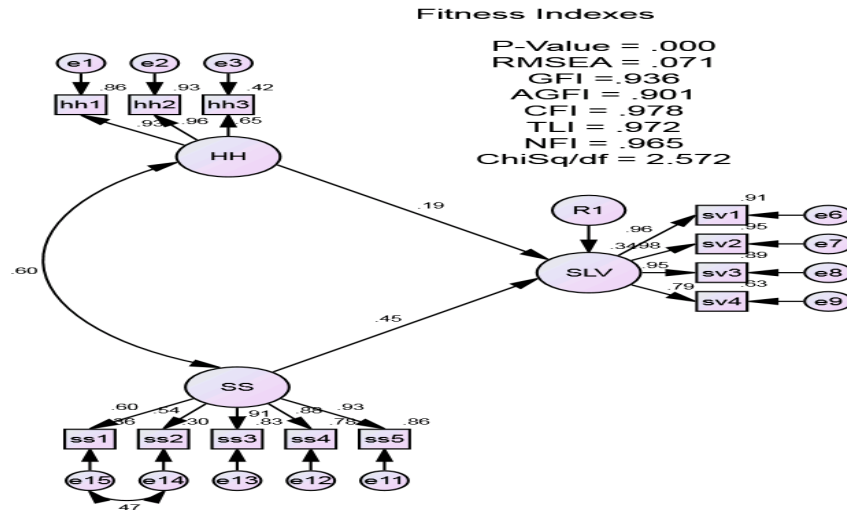


Figure 2The SEM (Standadized regression wights)

Table 5: Rule of Thumb

Name of category	Name of Index	Level of acceptance	Coments
1. Absolute fit	Chisq	p> .05	Sensitive to sample size >200
	RMSEA	RMSEA<.08	Range .05 to .1 is acceptable
	GFI	GFI>.90	GFI=.95 is a good fit
2.Incremental fit	AGFI	AGFI> .90	AGFI=.95 is a good fit
	CFI	CFI> .90	CFI=.95 is a good fit
	TLI	TLI> .90	TLI=.95 is a good fit
	NFI	NFI> .90	NFI=.95 is a good fit
3. Parsimonious fit	Chi/df	Chi/df< 5	The value should be less than 5

Source: (Zainudin 2015)

4.5 Health hazards and sustainable livelihood

The β value of 0.181 in Table 4 between health hazards and sustainable livelihood indicates that Health hazards as an important factor affecting their satisfaction level. Thus, the study agrees that health hazards have a significant impact on sustainable livelihood.

4.6 Source separation and sustainable livelihood

The β value of 0.43 in Table 4 between source separation and sustainable livelihood indicates that Source separation as an important factor affecting their satisfaction level. Thus, the study agrees that

source separation has a significant impact on sustainable livelihood.

4.7 The goodness of fit index

The result showed that the GFI of the model is 0.936. in Table 6. It shows the model is acceptably good [1] [2] [3]. Based on However the structural model fits the observed data ,since the value of the Normed chi square (CMIN/DF) was 3.14 , the recommended value by the statistician is below 5 is acceptable and good fit. Similarly other fit indices showed good indicators for the revised model (CFI= 0.901 and RMSEA = .07) and Following the table by scholars (table rule of thumb) [45] and [9].

Normed fit index (NFI) =0.935 and .TLI=0.912 on Table 5. For the incremental fit measures, Comparative fit index (CFI), Normed fit index (NFI), and Incremental fit index (IFI) were performed well. The values of these were achieved the recommended level of . And also, for the absolute fit measures, the likelihood-ratio χ^2 Root mean square error of approximation (RMSEA) were adequate value. Table 6, all fitness indexes showed that the model is considerably fit [1] [2] [3].

Table 6: Fit index

Model	RMR	GFI	AGFI	PGFI
Default model	.091	.936	.901	.600
Saturated model	.000	1.000		
Independence model	.710	.247	.110	.209

5. CONCLUSION

Poverty alleviation has been one of the main agenda for development in most developing countries. The findings of this study imply that industrialization with formal sector, will have a positive impact on efforts of the nation to reduce poverty. Hence, the study's findings suggest that participation of the Waste Pickers in non-waste picking activities does not necessarily reduce their likelihood of being poor. The findings of our study support the view that planned, monitored, and supported waste picking activities can be a viable option for reducing poverty among the urban poor. Organizing and training informal recyclers in Municipal Solid Waste Enterprises (MSWE) was a very effective way to upgrade their ability and add value to the materials collected. The involvement of the private sector in delivering Municipal Solid Waste Management (promoting organized and systematic waste management activities, such as intensifying urban in MSWM) services is a major theme in current efforts to improve MSWM in developing economies. Framing policy to develop skilled waste workers could be an effective strategy towards implementing a sustainable waste management system in Bangladesh. Particular interest is on the question of whether some of these factors actively play a role in reducing the possibility of being poor. Estimating the contribution of solid waste management at Dhaka is essential for the developed awareness and management of human resources, protection of community wellbeing, and proper training program for the waste workers. This study has attempted to document several links and connections between the reduction of urban poverty and the attainment of a sustainable livelihood emphasising on solid waste management amongst the waste workers in Dhaka city, Bangladesh.

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