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REPORT OF THE STUDY

Health Impact of Solid Waste Management in Four Slums of Dhaka City

DSK দুঃস্থ স্বাস্থ্য কেন্দ্র DUSHTHA SHASTHYA KENDRA

বারসিক BARCIK

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About the study

This study has been commissioned by the Dhaka CALLING project under the Promoting Advocacy and Rights (PAR) Activity financed by the USAID and technical support is provided by the Counterpart International (CPI) to document an overall understanding of the impact of Municipal Solid Waste (MSW) management on the physical and mental health of slum dwellers. The study does not investigate the quantitative relationship between MSW management and health impact rather it undertakes a qualitative assessment of the same to advocate for policy change and to contribute in further research.

Data has been collected through desk review, key informant interviews with local and city-level duty-bearers and service providers, community focus group discussions in four low-income communities: Molla slum, Balur Maath slum, Korail slum and Bou Bazaar slum. Recommendations from this study will influence future activities of Dhaka CALLING and supplement the ongoing advocacy discussions at the national and city corporation levels in Dhaka.

Dhaka CALLING consortium member inSights in cooperation with its partner, conceptualized the study and partnered with Health21 to conduct the study on the ground.

Dhaka CALLING (Dhaka Citizens' Advocacy Collaboration against polluting environment)

is a consortium led by Dushtha Shasthya Kendra (DSK) members including Bangladesh Resource Center for Indigenous Knowledge (BARCIK), Coalition for the Urban Poor (CUP), and inSights. Supported by the USAID funded Promoting Advocacy and Rights (PAR) activity in Bangladesh with technical support from Counterpart International. The Dhaka CALLING project kicked off in January 2021 with an aim to improve the implementation and enforcement of environmental laws and rules in response to identified community needs pertaining to pollution in four slum areas of Dhaka city.

inSights - Institute of Innovations for Gender and Humanitarian Transformations

is a Bangladesh-based social enterprise providing insights that challenge the current ways of working in humanitarian aid and gender affairs. inSights aim to transform ideas within the humanitarian, social and business sectors and turn them into innovations, knowledge, and strategies. inSights works to equip humanitarian responders – people and organizations – with knowledge, skills and competencies so that people affected by crisis receive the appropriate help when they need it most.

inSights provide technical advisory and communication support as a consortium member of the Dhaka CALLING project.

Health21

is a national-level *Think Tank* in the health sector working for national health vision and boundaries to promote countrymen's wellbeing. It aims to encourage the healthcare service providers to be within globally accepted norms and practices and to render the best services through developing and promoting effective workforce management, Health21 works for health and related aspects nationwide through policy-making dialogue with the policymakers along with the most influential health practitioners. Health21 has provided necessary support to conduct the study and prepare the report.

Acknowledgements

Research Team: Dr. A J Faisel, MBBS, DPS, MPH, and Dr. Avijit Poddar, PhD

Research Adviser: Suman Ahsanul Islam, Advisor-inSights & Technical Advisor-Dhaka CALLING project

Research Editor: Prof. Afsan Chowdhury, Nahid Siddiqui (Ms)

Coordination: Niger Rahman, Media and Communication Manager, inSights

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For communication and comments:
inSights - Institute of Innovations for Gender and Humanitarian Transformations
1/11, Iqbal Road (3rd floor), Mohammadpur, Dhaka - 1207, Bangladesh.
Phone: +880-(0)1911-478 566
Email: insights.dhk@gmail.com
Website: www.insightsbd.com

DSK- Dushtha Shasthya Kendra (DSK)
House- 741, Road-09, Baitul Aman Housing Society, Adabor, Dhaka-1207, Bangladesh.
Phone: +880-2-48115079, +880-2-55010253, +880-2-58153413
Email: dskinfo@dskbangladesh.org
Website: www.dskbangladesh.org

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Acronyms

BARCIK	Bangladesh Resource Center for Indigenous Knowledge
BCC	Behavioral Change Communication
BRAC	Bangladesh Rural Advancement Committee
BSMMU	Bangabandhu Sheikh Mujib Medical University
CBO	Community Based Organization
COVID-19	Coronavirus disease 2019
CS	Civil Surgeon
CSO	Civil Society Organization
CUP	Coalition for the Urban Poor
DC	Deputy Commissioner
DG	Director General
DGHS	Directorate General of Health Services
DSK	Dushtha Shasthya Kendra
DPS	Diploma in Personnel Management
ED	Executive Director
FGD	Focus Group Discussion
GOB	Government of Bangladesh
HPNSP	Health Population and Nutrition Sector Program
ICDDR, B	International Centre for Diarrhea Disease Research, Bangladesh
IEC	Information, Education, and Communication
IEDCR	Institute of Epidemiology, Disease Control and Research
IDI	In-depth Interview
JPGSPH	James P Grant School of Public Health
KII	Key Informant Interview
MOHFW	Ministry of Health and Family Welfare
MSW	Municipal Solid Waste
NA	Not Applicable
NGO	Non-Governmental Organization
NIPORT	National Institute of Population Research and Training
PAR	Promoting Advocacy and Rights
STS	Secondary Transfer Station
TOR	Terms of Reference
UHC	Universal Health Coverage
UK	United Kingdom
UNICEF	United Nations International Children's Emergency Fund

Executive Summary

Introduction

Bangladesh has been recognized as a middle-income country. As the country's economy is now city-centric, urban and municipal areas are expanding rapidly. Poor people from villages are coming to the city to earn a living. Most of them are moving into slums creating difficulties caused by increased population but the limited level of resources available in slums.

Population growth and expansion of the city also cause increasing waste generation. On average, about 25,000 metric tons[1] of waste are generated every day in the cities of Bangladesh alone. This large quantity of waste poses a threat to the environment and public health of the cities due to inadequate actions to dispose or reuse waste at the earliest. Although the relevant department of the govt. is taking multi-faceted actions to manage waste and recycle it, the lack of good practice and good governance is still being noticed.

The study has generated a comprehensive understanding of both the physical and mental health impact of the waste management system on the dwellers in selected slums. It gathered information on people's perceptions and practices regarding waste management issues in and around the slum areas and possible solutions. This evidence can be used for wider advocacy activities among the stakeholders and policymakers. The assignment was conducted using a combination of secondary and primary source-based research gathering methods.

This study was conducted on the health impact of solid waste management on the marginalized people who live in four selected slum areas in Dhaka South and North City Corporation (Mollar Slum and Korail Slum of Ward 06 and 19 of Dhaka North City Corporation, and Balur Maath Slum and Bou Bazar Slum of Ward 14 and 55 of Dhaka South City Corporation). The outline and objectives of the study were set by the Dhaka CALLING Consortium (DSK, BARCIK, CUP, and inSights). This study was funded by the USAID, and the technical partner of the project was Counterpart International.

Objective

In this study, the impact of waste mismanagement on health, economic and social conditions in urban slum areas has been reviewed and analyzed. The overall health condition of slum dwellers has been portrayed in this study report. The study's goal is to advocate for possible ways to collaborate with the government to tackle the problem based on the research's findings and analysis of the policy-making process.

The title of the study is "Health Impact of Solid Waste Management in Four Slums of Dhaka City", it's an Overview of four slum areas of Dhaka city - a qualitative study. The statistical data presented in this study are drawn from previous studies on the topic. Through this study, Dhaka CALLING project hopes to present an overall profile of waste management in slum areas, which will lead to more efforts to understand and mitigate the problems.

[1] [4]

Methodology

The report is a qualitative study using a combination of secondary and primary research methodologies. The study generated primary data using a range of qualitative methods like FGD, IDI, KII, consultation meetings, and group sessions. The secondary data was used by reviewing the published documents that are available on the internet and in journals, and exploring the existing laws and policies of the Government of Bangladesh.

Key Findings

Findings were based on a desk review and analysis of secondary documents available online relating to solid waste management and its health-related impacts. Though there are several studies relating to health hazards as an impact of solid waste, very few studies specifically focusing on the impact of solid waste on children, women, adolescents and youths, older people, and persons living with disabilities exist.

The mental and physical health of marginalized people is at risk both in the short and long run, due to the polluted environment caused by poor solid waste management. Diseases like fever, runny nose, headache, skin infection, urinary tract infections, and some cases may indirectly be the cause of cancer, jaundice, pneumonia, and typhoid have been found to affect people because of the mismanagement of waste. Such findings are confirmed in various other studies as well.

Around 34 percent[2] of the people affected suffer from the above-mentioned ailments due to the unclean environment. A study found that 27 percent of people could be infected with such diseases due to filthy water and 19 percent due to waterlogging. According to another survey report, urban slum dwellers have a higher infant mortality rate than rural people. Furthermore, a report has shown that in slums, 57 children per thousand die; in villages, 49 children per thousand die.[3]

The average income of the slum dwellers of Dhaka is around six to fifteen thousand BDT. However, fifty percent of them are illiterate[4]. Due to low literacy rates, these marginalized people's health awareness is low. Furthermore, according to various studies, roughly 47 percent of slum dwellers utilize sanitary latrines that are situated in unhygienic conditions[5]. Although 52 - 55 percent of slum dwellers rely on government hospitals for their treatment, the risk is still there as the care service is not accessible easily or in a timely fashion[6].

Recommendations

Based on the study, the Team would like to make the following recommendations:

For the Policymakers

⇒ An inter-ministerial coordination committee including the Ministry of Social Welfare, Ministry of Information, Ministry of Women and Child Affairs, Ministry of Health and Family Welfare, Ministry of Local Government and Ministry of Environment, Forest and Climate Change should be immediately set up. This will increase the delivery capacity, reduce duplicate efforts and formalize the official efforts of the GOB.

[2] [29, p. 9 t.2]
[3] [22, p. 2]
[4] [29, p. 4]
[5] [29, p. 4]
[6] [30, p. 7]

⇛ A sewerage system in the slum areas should be set up as an immediate priority.

⇛ Set up a formal waste management monitoring system involving all the stakeholders and led by the GOB.

⇛ An inter-ministry collaborative approach can be taken to recognize and address the issues of particularly the vulnerable people such as the physically challenged people-young and elderly. For instance, Social Welfare Ministry, Education Ministry and Ministry of Women and Children Affairs can work together to reduce vulnerability of these slum people specially persons with disability and elderly achieving their agenda side by side.

⇛ Mental illness is an ignored silent killer in Bangladesh. In addition, low-income people do not recognize this as a health issue. The multi-sectoral cost of mental health and its impact on slum dwellers must be calculated and addressed.

⇛ Public health issues are not included in the existing law on waste management. This is only an issue under the Environment, Forest, and Climate Change Ministry. Considering it's a public health issue, the Ministry of Health and Family Welfare should be brought into the picture and responsibilities shared. The Ministry of Health and Family Welfare and the Ministry of Local Government may jointly undertake planning and monitoring activities.

For NGOs & Private Sectors

⇛ Efforts must be made to raise awareness of the Public Health implications of all waste issues.

⇛ Long-term research should be commissioned to determine the effects of all harmful and negative elements of trash on health, focusing on pregnant women, children, the elderly, and individuals with disabilities.

⇛ Mental Health problems appear to be quite prevalent among slum dwellers, particularly among youths and adolescents, as a result of a number of interrelated factors, including the stench of the slums, which has resulted from improper waste management; a lack of mental privacy; and numerous types of illnesses. Initiate telemedicine or counselling services in order to treat mental health concerns with the priority they merit.

⇛ Engage youth and slum dwellers in different actions for a clean and healthy living environment.

⇛ Further combined research may launch to get a clear scenario of the waste management and health impact.

Chapter One:

Background, Introduction, Context, Objectives and Limitations of the Study

1.1 Introduction of the study

Inefficient waste management systems have a very negative effect on public health, which is troublesome, particularly for low-income neighborhoods, including slums. Under the Promoting Advocacy and Rights (PAR) Activity, DSK Consortium executed the Dhaka CALLING initiative on behalf of Counterpart International with financing from the USAID.

Dhaka CALLING strives to promote active citizenship and a coalition of impoverished and marginalized city residents in order to meet environmental pollution challenges caused by improper solid waste management. It aims to improve the implementation and enforcement of environmental laws and rules in response to identified community needs pertaining to pollution in its project intervention areas. Additionally, it seeks to empower slum dwellers so that their voices may be heard by the authorities and policymakers.

The DSK Consortium, consists of Dushtha Shasthya Kendra (DSK), Bangladesh Resource Centre for Indigenous Knowledge (BARCIK), Coalition for the Urban Poor (CUP), and Institute of Innovations for Gender & Humanitarian Transformations (inSights), has implemented initiatives to improve the health and living circumstances of the disadvantaged in four slums. The consortium has contracted Health 21 to analyze information on the health consequences of improper waste management in slums in accordance with the project's study objectives.

Using a bird's-eye-view survey, inSights and its consortium partners have been collecting and compiling health impact results from intervening slums in order to assess the health impact of slum inhabitants due to ineffective waste management systems. The purpose of this research is to create suggestions for future in-depth research and advocacy initiatives based on the findings and recommendations of this study.

At this point, the standard definition of a slum (presented in the box) has been framed for the accompanying study. However, the study has followed the definition of slum used by BBS and the Census of Slums Areas and Floating Population 2014 by the GOB.

What are ‘Slums’?

Slums are temporary shanty living quarters which are usually set up by people who have come from the villages to the cities in the hope of gaining a livelihood by doing different kinds of odd jobs. The slums usually grow in government-owned but not used areas, including both in the main and the outskirts of the city. The living

quarters or rooms are located in a crammed situation with almost no privacy and very poor sanitation conditions. All amenities of urban life are almost absent such as access to fresh drinking water, sewerage and drainage systems. The average income of the slum residents is about BDT. 5000 to Taka 22,000 per month[7]. Hence, they are unable to afford them, including health services.

A squalid and overcrowded urban street or district inhabited by very poor people is called "inner-city slums"[8].

UN-HABITAT[9] defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following:

1. Durable housing of a permanent nature that protects against extreme climate conditions.
2. Sufficient living space which means no more than three people sharing the same room.
3. Easy access to safe water in sufficient amounts at an affordable price.
4. Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people.
5. Security of tenure that prevents forced evictions.

A Slum is a cluster of compact settlements of 5 or more households which generally grow very unsystematically and haphazardly in an unhealthy condition and atmosphere on government and private vacant land. Slums also exist on the owner-based household premises. Generally, a slum has the following six characteristics:

i. Structures of slums are generally very small such as *jhupri*, tong, chai, tin-shed, semi Pucca structures and dilapidated buildings. Structures of slums are built of very cheap materials.

ii. Population density and the concentration of structures are very high in a slum area. Density can be looked at in two ways:
   a. Rooms are crowded: Generally, all members of the household live in one room.
   b. Structure Density: Three or more structures are situated in one decimal of land,

iii. Ownership of land Slums generally grown in Government, Semi-Government land, private vacant land, abandoned building/houses, and slopes of Hill or rail-line & roadsides

iv. Water supply and sanitation in slum areas, water supply is insufficient and unsafe. Sanitation systems are quite inadequate (15 or more people use one toilet). Overall, a very unhygienic environment exists in slum areas.

v. Socio-economic condition: Socioeconomic status of the slum dwellers is very Low. Slum-dwellers are generally engaged in informal non-agricultural jobs. Only a few of them who are living in the District or Upazilla level might have a small parcel of agricultural land.

Census of Slum Areas and Floating Population 2014, BBS, GoB., 2015
http://203.112.218.65:8008/WebTestApplication/userfiles/Image/Slum/FloatingPopulation2014.pdf

[7] Data of the study titled Health Impact of Solid Waste Management in Four Slums of Dhaka City by DSK Consortium
[8] (htt)
[9] (UN-Habitat - State of the World Cities 2006/7)

1.2. Context of the study

Bangladesh is becoming eligible as an economically middle-income country. The economy of Bangladesh is still city-centric. Rising urbanization is promoted by a rising economy more rapidly in all cases. Urbanization, on one hand, accelerates socio-economic development and on the other hand brings constraints in housing, education, livelihood, employment, and health-hygiene services for a significant number of migrants from rural areas. According to the Bangladesh Bureau of Statistics, the total population of Dhaka in 1971 was 15 lakh 22 thousand (est.) which climbs to 2 crores 24 lakh 8 thousand in 2022.[10] In other words, the population of Dhaka has risen 14 times in 51 years.

Due to natural catastrophes and lack of employment, impoverished people migrate to the cities. Most of them arrive in cities and live in slums or low-grade neighborhoods. It is evident from different researches that nearly 4.73–5.3 million people in Dhaka live in 3–5 thousand slums (low-income regions).[11],[12],[13]

Bangladesh is a densely populated country where 162.7 million (BBS, 2018) people inhabit 147,570 square kilometers or 1,115.62 inhabitants per square kilometer[14]. Several studies disclosed rapid urbanization and the rising population in Bangladesh are causes of the country's high garbage output. According to Bangladesh Environment Conservation Act, 1995, waste is, *"any solid, liquid, gaseous, radioactive substance, the release, disposal, and throwing away of which may cause deleterious changes to the environment."* On the top, waste generated in residential, industrial, institutional, commercial, municipal, construction, and demolition sites are termed municipal solid waste (MSW).

A comparative data investigation revealed that the amount of waste created in 1970 was 11 million (11,000,000) tons, which increased to 52 million (52,000,000) tons in 2015, with an annual increase rate of 134,300 tons per year. In 2013, the total quantity of municipal solid waste (MSW) created in urban areas of Bangladesh was 5.2 million (5,200,919) tons/year by 36.97 million (36,986,768) residents (0.35 kg/cap/day). However, in 2015, the total amount of urban waste was 5 hundred 11 thousand (511,000) tons/year by 39.49 million (39,488,000) dwellers (0.32 kg/cap/day).[15]

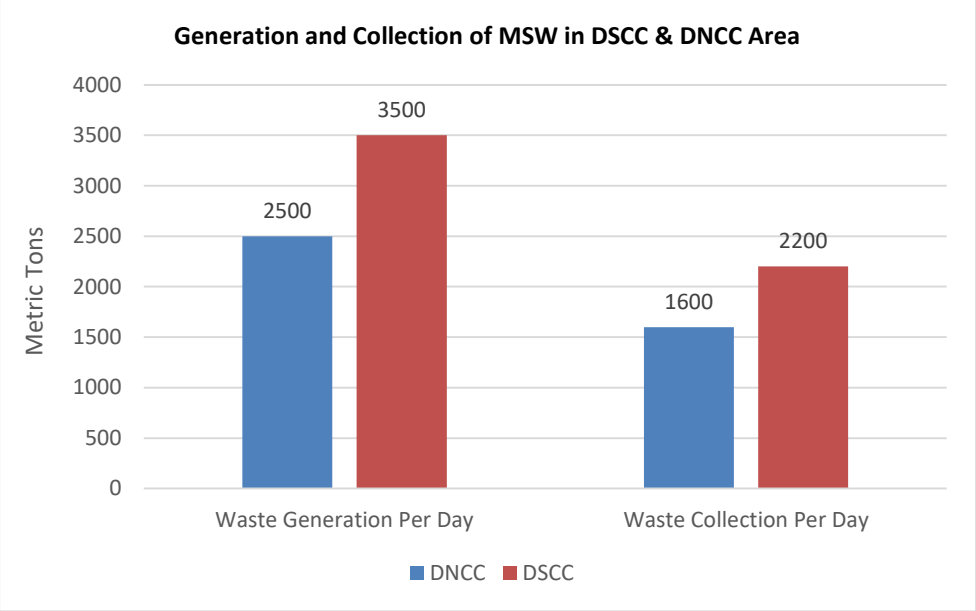
By 2025, waste generation in metropolitan areas of Bangladesh is projected to increase to 0.6 kg/cap/day, with a total generated waste volume of 57,718 tons/day[16]. Nawshad Ahmed (PhD), an economist and urban planner, articulated in another editorial that cities in Bangladesh daily produced 25 thousand tons of waste. Dhaka itself produced one-third of the total daily waste.[17]

Solid Waste Generation in Dhaka City

Organic waste accounts almost 70% of total waste generated in Dhaka city. Household activities, commercial as well as industrial ventures are the major contributor of solid waste. Every day about 6000 tons of solid waste is produced in Dhaka, of which 2500 tons originates in the DNCC area and 3500 tons in DSCC area. Almost

[10] [7]
[11] [33]
[12] [2]
[13] [5]
[14] [3, p. 3]
[15] [32]
[16] [3, p. 3]
[17] [4]

1600 tons of solid waste remains uncollected in Dhaka city, which can cause numerous pollution, health hazards and create obstacles in the drainage system.[18]



This massive volume of waste is a threat to the environment and public health of cities owing to poor disposal or recycling. Although the concerned departments of the government have made numerous initiatives for waste management and recycling, there is still a lack of effective disposal and proper management. And these wastes have a detrimental influence on the city dwellers, especially the disadvantaged or the impoverished.

Waste dumped near a water source causes contamination of the water body or the groundwater source. Other high-risk groups include the population living close to a waste dump and those, whose water supply has become contaminated either due to waste dumping or leakage from Secondary Transfer Stations (STS) and landfill sites. Uncollected solid waste also increases the risk of injury and infection.

1.3. Objectives & scope of the study

The study summarized the physical and mental health consequences on slum inhabitants caused by inefficient waste management. This includes economic costs of waste management system failure. In addition, the knowledge, attitudes, perceptions, and actions of the four project slum residents were studied. Overall, the scope included identifying the mental and physical health dangers posed by inappropriate waste management to enable further advocacy and awareness-raising activities.

It provides a comprehensive picture of the physical and mental health implications and consequences of a poor waste management system and reveals the gaps and difficulties in implementing the existing policies to address this issue, which may lead to more difficulties that require advocacy for changing the situation.

A study objective was to gather evidence for developing an overview of the situation that could trigger more in-depth research on the topic- urban disadvantaged communities' public health challenges due to ill-managed

[18] [32]

solid waste. This study will also generate chances for negotiation with stakeholders, such as authorities, business sectors and those at-risk including advocacy actions.

1.4. Expected outcome of the study

It is expected that the outcome of the study will give a comprehensive understanding of the physical and mental situation of the slum community which has grown/developed over time mostly on the landfills and STSs by the waste collected from the household level in the urban areas. This would thus give a map of the physical and mental health of the concerned people. While doing data analysis, the conditions of different vulnerable populations such as the elders, pregnant women, physically challenged ones, etc. and the gender factor will be taken into account.

1.5. Limitations of the study

The study is based on secondary research and limited qualitative data that examines public health challenges in slums from a macro perspective. Data presented are sourced from several published studies and web sources. It can provide a broader overview that can create a better understanding of the situation and an opportunity for additional in-depth research on the health effects of the waste management system. This work may be deemed exploratory as it opens the door for further research.

Chapter Two

Methodology & Analysis Technique

2.1. Methodology

2.1.1 Study location and demographic information

Two Wards of Dhaka North City Corporation (DNCC) including two slums:

(i) Molla slum at Ward-6 Mirpur in DNCC;

(ii) Korail slum at Ward-19 Banani in DNCC;

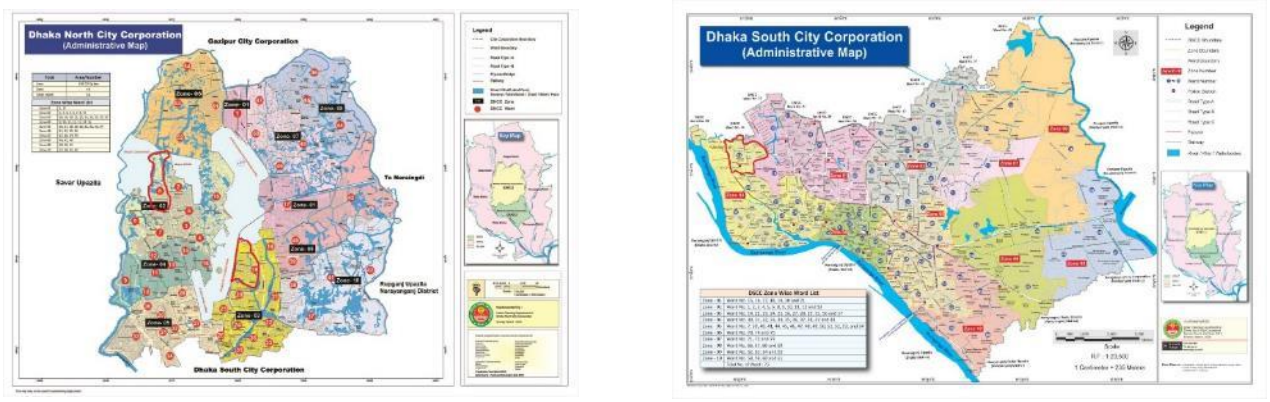
The total population of Dhaka North City Corporation (DNCC), as per the report published Waste Report 2018 -2019 was 6.10 million. The population density was Max 102,034 per/sq/km and min 2661 per/sq/km.[19]

Dhaka South City Corporation – Ward 14 & Ward 55

(i) Hazaribagh Balur Maath slum

(ii) Hazaribagh Bou Bazaar slum

As per the DSCC database, the total population in this DSCC is 12 million (2020).[20]



Picture 1 DNCC & DSCC MAP

2.1.2. Research questions

⇒ What are the health risks that residents in the slums face because of the polluted and unsanitary conditions?

⇒ What are the economic effects that residents in the slums face because of a polluted and disease-infected environment?

⇒ What are the policy barriers and gaps that prevent the policymakers from implementing existing policies?

[19] [10, p. 4]
[20] [11]

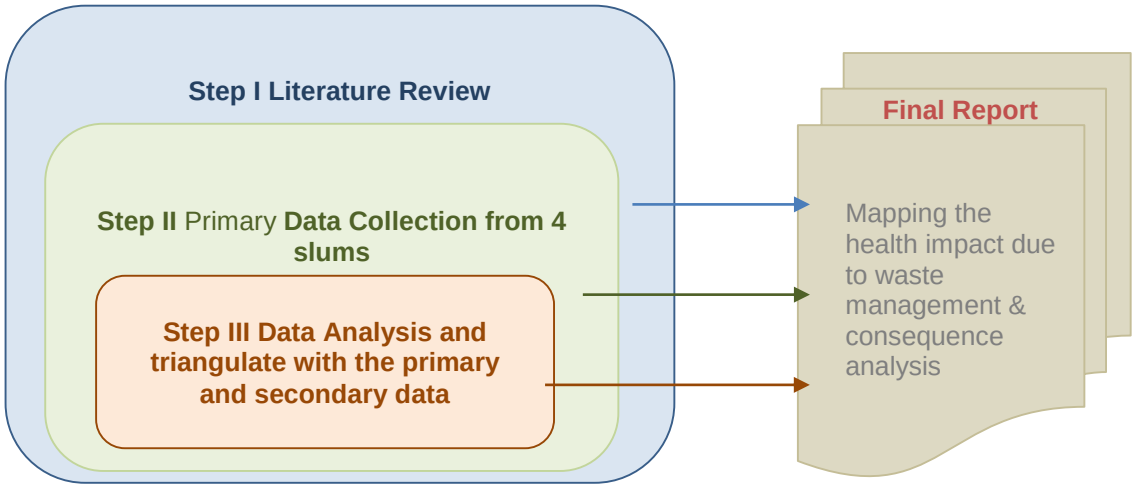
2.1.3. Respondent category

The major respondents of the study were slum CBO leaders, pregnant mothers, teenage girls and boys, waste collectors and consortium members/ managers. Since diverse age groups are living in slums, 15-65 age groups were included in this study. Though the study team considered diverse sex and minority groups for this analysis, other than male and female, there was no diverse groups representation identified in the fields. Persons with disabilities were also addressed and 1 male person with a disability was interviewed. Out of 29 respondents, 59% were females.

The study was conducted in accordance with ethical principles and it respected human dignity as well as human rights as per standard research guidelines. The aims and objectives were discussed with respondents while collecting data from the field.

2.1.4. Study design

Flow Chart 1 Study design and technique



2.1.5. Primary data collection method

The assignment as envisaged was conducted as a combined study using secondary and primary research information-based methodologies. The study generated primary data/information using a range of qualitative methods like FGD, IDI, KII, consultation meetings and sharing sessions. The secondary research involved the review of pertinent national and global documents/practices and standards available in published literature for exploring contemporary theoretical aspects as well as existing practices in the municipal waste management system.

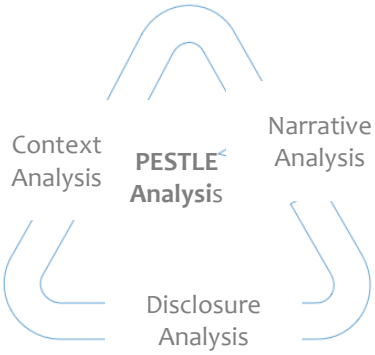
The following activities were held for the successful accomplishment of the assignment:

- ⇒ Holding preparatory discussions with responsible persons of the consortia members about the overall preparation, planning, and execution strategy of the task;
- ⇒ Developing study design, preparing all necessary methods, tools & strategies and efficiently conducting them and finalizing reports in consultation with inSights;
- ⇒ Assigning qualified enumerators/researchers and organizing orientation for common understanding within the team for fieldwork, data collection and quality control;

- ⇛ Conducting a desk review of other relevant global and national documents/practices and standards on waste management systems including a review of theoretical aspects of waste management systems along with an appraisal of global practice;
- ⇛ Consulting key stakeholders and beneficiaries of the project.
- ⇛ Conducting consultation meetings/discussions (meet/online where suitable) with field staff and the project office staff for their input;
- ⇛ Conducting field test and review of the analysis plan;
- ⇛ Debriefing senior management on the findings for their feedback and inputs to finalize the report.

2.2. Data analysis

To assess and summarize, experts apply a mixed methodology. In order to do this, the research team investigated the pertinent contexts already indicated in the secondary reports. The findings were summarized using narrative analysis and discourse analysis approaches, which were based on the literature review and primary data findings. PESTLE (Political, Economic, Social, Technological, Legal and Environmental). The analysis examined the interconnection of the research problems which is one of the primary goals of the study.



Flow Chart 2 Data Analysis Technique

2.3. Ethical considerations

At every point, including conception, data collecting, storage, and application, every effort was made to guarantee that this study adheres to the highest ethical standards and international best practices. The ethical guideline of inSights follows a "do no harm" policy. Consequently, the following ethical precautions were applied:

- ⇛ Respondents' consent was taken before commencing the interview;
- ⇛ Respondents were informed that participation in this study was not linked to accessing services or payment of any kind and participation in the study was undertaken voluntarily;
- ⇛ Respondents' names and identities were anonymized for their safety and comfort;
- ⇛ Respondents' pictures were taken with their prior permission;
- ⇛ The study team made sure that participants suffered no harm or no discrimination from the study, other development actors, or other groups or powerful individuals as a result of their participation or non-participation.

Chapter Three

Health and Environment Impact of Solid Waste Management: Theoretical Aspects and Global Practices: Literature Review

3.1. Secondary literatures

Negative impact on health due to improper waste management

An ecology that includes public health is negatively affected by improper waste management and unauthorized waste disposal. It may lead to soil, water, and air pollution.

Untreated or improperly disposed of waste may cause major health risks to individuals in the neighborhood of the disposal site. Leaks from the garbage may pollute soils and waterways, as well as cause air pollution through emissions of heavy metals and persistent organic pollutants (POPs), posing a threat to human health.

A picture illustrated in a blog published in Metropolitan Transfer Station (MTS) in October 2017 indicated six environmental contaminants or hazards that occurred due to improper waste management.[21]

Flow Chart 3 6 Negative Effects of improper Waste management

Improper trash disposal may cause serious public health incidents

Other threats created by unregulated trash disposal that cause adverse impacts include landscape degradation, local water and air pollution, and littering at the local level. For health reasons, it is crucial to dispose of trash in a responsible and ecologically sound manner[22].

[21] [12]
[22] [26]

Despite the growing recycling efforts initiated in Bangladesh[23], there is a lack of landfills, STS and incinerators which are significant needs for proper waste disposal[24]. Uncontrolled and/or mismanaged MSW disposal causes serious damage, landscape deterioration, local water and air pollution, as well as littering[25].

Compared to waste treatment operations, such as mechanical biological treatment (MBT) facilities, information on less severe illnesses has recently been available. Research[26] show that such waste disposal facilities are not found in Bangladesh, neither significant research data nor any primary initiative by the authorities or private sectors is available. Therefore, the outcome of these evaluations is inconclusive; there are certain issues in interpreting data from primary studies which need a resolution that is caused as a result of their non-homogeneous design and lack of precise exposure information and control of relevant confounders.

Physical health and Dhaka slums[27],[28],[29],[30],[31]

In disadvantaged communities, there is an obvious absence of government programs for waste management. The area's surroundings and environment are highly contaminated due to improper garbage management. The residents in the area suffer from physical and mental health as a result of the contaminated environment. In the slums and neighboring regions, improper waste management is harming the ecosystem by contaminating the air, water, and soil with rubbish. Even waste from other regions is deposited in low-income communities, leading inhabitants to get fevers, coughs, headaches, renal problems, and even cancer.

Mental health and Dhaka slums

Another unaddressed issue is the mental health situation in urban areas as well as in slums[32]. In most of the cases, *"mental well-being was unequally distributed among the population and younger, male, and more affluent dwellers enjoyed better health."*[33] *Al*so, physical health and well-being, as well as financial conditions, are associated with mental health.

People at risk of waste management

Relevant to the health implications of waste management are the size and composition of the population exposed to these dangers. Contrary to what occurs with urban ambient air pollution, only a small portion of the population living in close proximity to waste management facilities is exposed to pollution from waste management facilities. Various reports have suggested that between 2 and 6 percent of the local population is affected[34],[35]. In addition, the population residing near waste disposal factories is frequently poorer than the overall population, resulting in environmental health disparities.

[23] [3, p. 4]
[24] [3, p. 8]
[25] [26]
[26] [26, p. 16]
[27] [29]
[28] [4]
[29] [30]
[30] [8]
[31] [15]
[32] [13, p. 2]
[33] [13, p. 8]
[34] [26, p. 16]
[35] [14]

Numerous studies have revealed a correlation between local area impoverishment and proximity to incinerators and landfills[36]. Waste collectors in low- and middle-income nations sift through highly contaminated domestic waste in dumps and landfills, exposing themselves to health risks[37]. The health of the local populace, particularly in low-income neighborhoods, can be jeopardized by waste management facilities, such as dumps, landfills, and incinerators, in addition to the collection of uncollected garbage. Household waste becomes dangerous and poses health concerns to those handling garbage without protective equipment and knowledge of how to manage these potentially hazardous items[38].

Occupational health effect

Some studies have provided evidence of an association between residence near legal landfills and different health risks, but overall, such evidence is not conclusive. The weakness of the observations is related, among other factors, to the quality of the exposure assessment. It has been noted that this measure may reflect and integrate different routes of exposure (not only air but also the contamination of soil or groundwater in the vicinity of the plant). This aspect, in addition to the ease of calculation, makes distance a still widely used metric. However, the distance at best can only provide a first-order approximation of the real exposure to pollutants emitted from this type of plant.

In the majority of instances, the evidence from occupational studies is insufficient to make an overall evaluation. There was no evidence of congenital abnormalities or low birth weight in people residing within two kilometers of landfills, with an elevated risk of 2% and 6%, respectively[39]. The additional risk appeared to be greater when hazardous waste sites were addressed.

There was minimal evidence of elevated cancer risk for populations residing within three kilometers of old incinerators, with an estimated extra risk of 3.5%[40]. For some cancer types, such as non-Hodgkin lymphoma and soft tissue sarcoma, the confidence in the evaluation and the projected excess risk tended to be higher than for other cancer types.

3.2. Difficulty analysis

A. SWOT analysis

Table 1 SWOT analysis and Gap management

Strength	Weakness	Opportunity	Threat	Gap Management
Number of secondary documents were found from secondary data sources.	Since, this was a qualitative report with a limited audience, this report may not represent the exact numeric data or the specific scenario regarding waste management and health impact.	Further in-depth research initiatives can be considered for getting vast data and analysis.	A variety of papers were considered in the research which was published at different times. Therefore, data may be inconsistent with the current data or findings.	Since the data may not match with the existing reports or literatures, it was verified with the experts. Since, the study is completely based on qualitative data with a nominal portion of the project slums, published reports, international standards and recent articles from different times were considered to find out the relevant information.

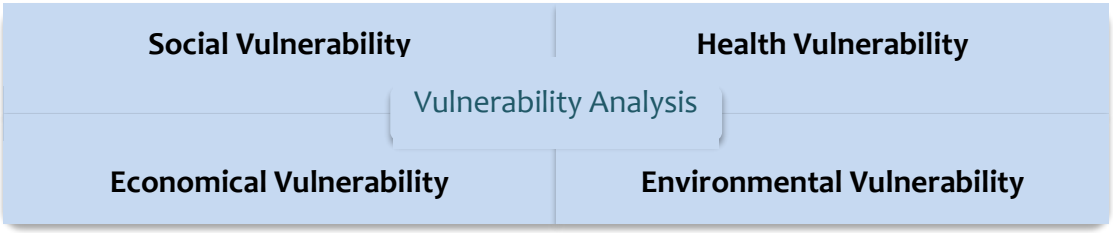
[36] [26, p. 16]
[37] [14, p. 1]
[38] [14, p. 2]
[39] [26, p. 16]
[40] [15, p. 1]

Chapter Four

Findings and Analysis

4.1. Vulnerability analysis of slum dwellers

Slum-dwellers are vulnerable in a variety of ways. Each vulnerability is linked to the others. The bulk of these individuals' hails from villages where they have enjoyed the same socio-cultural environment and where they occupy the majority status. Upon reaching Dhaka, they were instantly confronted by a heterogeneous population. This explains the widespread vulnerability while living in slums.



Flow Chart 4 Vulnerability factors of slum dwellers

4.1.1. Social vulnerability

Inadequate planning and a lack of suitable low-cost housing contribute to the demand and supply of slums. Social marginalization and inadequate infrastructure compel the poor to adapt to uncontrollable circumstances. Economic stagnation generates uncertainties and hazards for the poor, pushing them to remain in slums. In a nation with a rising population, economic stagnation diminishes per capita disposable income in urban and rural regions, hence increasing urban and rural poverty. Increasing rural poverty also drives urban migration. In other words, a badly performing economy promotes poverty and rural-to-urban migration, which in turn generates slums.

4.1.2. Health vulnerability

Unattended waste disposal sites might pose health risks to low-income communities. Improperly managed and built landfills and Secondary Transfer Stations (STS) attract all sorts of disease-spreading insects and rodents. Although STS, Landfills and dumping zones should ideally be situated at a safe distance from any human population, these are close to the slums, especially to the project locations (Bou Bazar and Balu Maath slums). The poor management of STS has a negative impact on the mental and physical health of slum dwellers. Korail and Molla slum residents lack sufficient room to dispose of their trash; hence, they dump in the lakes, drains, and adjacent regions.

The FGD participants, both boys and girls, discussed several kinds of mental issues. Most of the issues stem from the fact that they face a wall in life in building their future due to their impoverished families. Many of them became ill and some of them affected by COVID-19 lost their part-time jobs. They did not have any alternative source of income. Most display various levels of depression.

4.1.3. Economic vulnerability

Slum people are economically insolvent. Physical complicacy loads an extra burden on them as they need to go to doctor or buy some medicine from the nearer pharmacies. On the other hand, in Waste collectors from low- and middle-income groups sift through highly contaminated domestic waste in dumps and landfills, exposing themselves to health risks[41]. The health of the local populace, particularly in low-income neighborhoods, can be jeopardized by waste management facilities, such as dumps, landfills, and incinerators, in addition to the collection of uncollected garbage. Household waste becomes dangerous and poses health concerns to those handling garbage without protective equipment and knowledge of how to manage these potentially hazardous items[42]. Due to illness, slum people need to count about 800 to 1000 Taka per day, according to the field data. Please see case 7.

4.1.4. Environmental vulnerability

Homes, markets, hotels, restaurants, different infrastructure development activities, and industrial facilities are responsible for the city's solid waste. Solid wastes are destroying the city's ecosystem in several ways. Solid waste negatively impacts soil, water, and air. Waste management also impacts the physical and mental health of humans. Women, children, those with special needs, and the elderly are the most vulnerable to this pollution.

Recent research revealed that approximately 63 percent of rubbish is collected daily by the DNCC and DSCC. Every day, 37 percent of waste remains uncollected. Dhaka city creates an average of 6 – 10 thousand tons of solid waste every day. [43], [44] Dhaka North City Corporation (DNCC) produces 2500 (approx.) tons and Dhaka South City Corporation (DSCC) 3500 tons (approx.). It should be underlined that more than 1,600 tons of the city's daily rubbish are not collected.

[41] [14, p. 1]
[42] [14, p. 2]
[43] Sustainable Solid Waste Management for Urban Poor, October 2021, Dhaka CALLING Project
[44] [18]

Picture 2 Waste collected in front of STS

This uncollected waste creates enormous hurdles in the city's sewage system, including pollution and health dangers. Numerous compounds may be dissolved in water. It 'is a great solvent'[45]. It frequently contains dissolved things like chemicals and gasses. Rainfall readily combines with noxious fluids pollutants and flows into water streams to contaminate neighboring water bodies. Thus, the local pond, lake, drainage and even faucet drinking water are exposed to pollution risks.

As the sewage connections of these places are frequently connected to diverse water sources and reservoirs, the degree of contamination has increased in Dhaka city. As a result, water collects contaminants along its path to its destination. Besides, dispersed dirt falls into the drain, impeding water flow and causing flooding. Further, the chemicals inherent in these wastes and the air emitted by secondary transfer stations (STS) are hazardous to the local environment, ecology, and public health.

4.2. Mapping of health impact due to Waste Management System (WMS)

4.2.1. Brief description of Municipal Solid Waste (MSW)

Inspection/direct observation of the selected slum areas show that municipal solid waste (MSW) has two systems. They are solid waste generated by biodegradable products and second, waste which is non-biodegradable. The major proportion of MSW is organic, besides that there is also paper, plastic, metal, glass and miscellaneous waste. Organic waste includes leaves, timber waste, vegetable extract, kitchen waste, household waste, restaurant waste, fruits, and juice center residue etc. Paper waste includes paper dishes, newspapers, paper boxes, paper bags, wrapping materials (e.g., soap cover, toothpaste cover, matchbox cover) etc. Plastic waste includes plastic bags, and broken plastic material (e.g., mugs, buckets, pipes, plastic

[45] [12]

covers and plastic wrapping material). Metal waste includes screws, nut bolts, electronic parts, damaged vehicle parts etc. Glass waste includes broken glass materials, bottles and cans, glass lamps, bulbs, and tube lights. Miscellaneous waste includes all sanitary items.

The municipal solid waste management has a functioning cycle. All waste particularly from the households (mostly kitchen waste or the food waste from restaurants and wayside food stalls) is usually gathered in waste bins, plastic buckets, or plastic/polythene bags. Some garbage is gathered by the street sweepers and is put into certain places/dustbins. These are then collected by 'collectors' daily and taken to a dumping station called the Secondary Transfer Station (STS). In these places, these are then loaded on big steel containers placed inside the STSs. From these STSs the City Corporation garbage vans pick up the containers and dump them mostly into the landfills. In the Molla slum, the STS is yet to be set up.

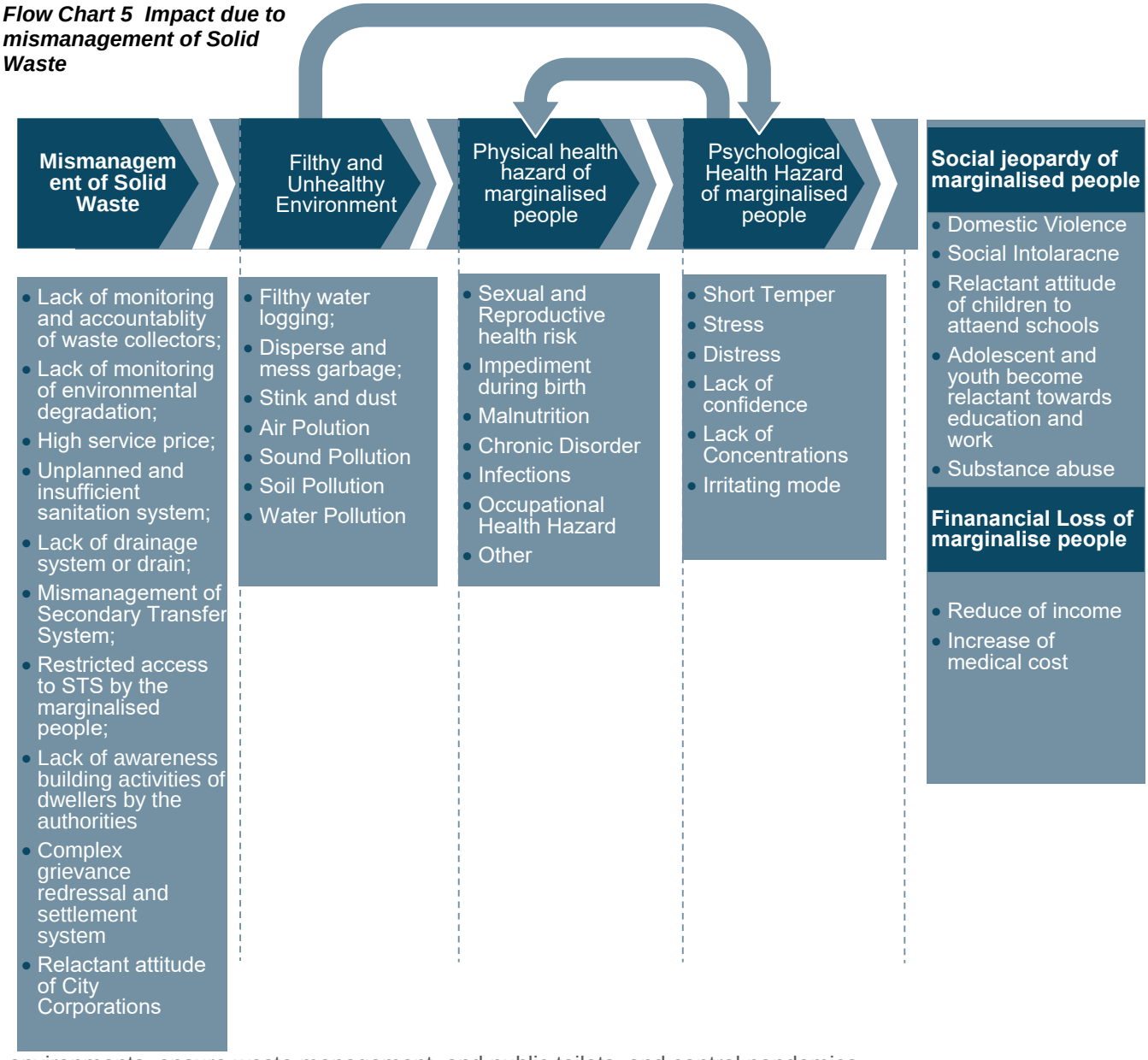
Some varieties of the waste such as plastics, papers, metals and glass are picked up by the rag-pickers who are mostly children living in the nearby slums and who sell these in some nearby dedicated shops who buy these and give them to foundries, paper board makers, etc. This business is a good means of livelihood for people living in the slums. In a couple of the IDIs, the respondents mentioned that these rag-pickers do not use any protective apparel, heavy-duty hand gloves, gum boots, spectacles, masks, etc. The non-use of protective items leads to injuries, skin diseases, etc.

All types of waste are thrown away indiscriminately including vegetable peels, regular domestic waste, animal carcasses, medical waste including infectious waste, e-waste, etc. When the decomposition of the wastes takes place various noxious gasses are released which again attracts rodents and pests who gather and further pave the way for serious health risks. It was also shared by the participants of data/information collection exercises that people often suffer from diseases like- diarrhea, malaria, and dengue due to unhygienic living practices.

4.2.2. Solid Waste Management (SWM) and health impact

The Paurashava Ordinance of 1977, the City Corporation Ordinance of 1983, and the current Local Government (Paurashava) Act of 2009 have given municipalities broad responsibilities in town planning and development, public health and sanitation, water supply and sewage disposal, as well as the maintenance of public infrastructure and facilities. The City Corporation Act of 2009 also redefined the City Corporation's function. Under the Acts, all private clinics, hospitals, diagnostic facilities, and paramedical institutions are required to get a license from the relevant City Corporations and municipalities, as well as eliminate unhealthy

Flow Chart 5 Impact due to mismanagement of Solid Waste



environments, ensure waste management, and public toilets, and control pandemics.

The real situation is however not positive. Dhaka and its neighboring districts are suffering the most from the dangers of pollution caused by careless dumping. Authorities are reluctant to penalize companies that dump the garbage as they wish.

While the waste management situation in Dhaka and its neighboring territory is in a bad state generally, the situation in the city's disadvantaged neighborhoods is particularly worrisome. The city collects and disposes of rubbish from affluent districts within its authority, leaving impoverished areas overrun with garbage. As a result, low-income individuals face the burden of inefficient waste mismanagement and health risks.

> *"As we don't have any option to deploy waste collector, the neighboring household are dumping their domestic waste just beside road and drains."*
>
> **FGD with youth, Molla Slum**

The city officials are unable to securely collect and dispose of all the rubbish generated within their authority, they not only appear to ignore the impoverished neighborhoods but actively utilize them as dumping grounds. The deplorable state of waste management is attributable to a lack of cooperation among the involved authorities and insufficient implementation of the Solid Waste Management Rules 2021.[46]

Again, many of the slums have been set up in landfills which are government/abandoned properties. Such conditions, in turn, facilitate the spread of infectious diseases. Very few of them have the awareness and perception of the harmful impact of open dumping. Their knowledge is not transformed into practice and there is a tremendous problem in their attitude about proper disposal methods as they are mostly located as tenants belonging to the least privileged cohort of the society. They lack proper awareness of the proper disposal method and hygienic living. Most of them have skin disorders and cough and cold are common problems in almost every household.

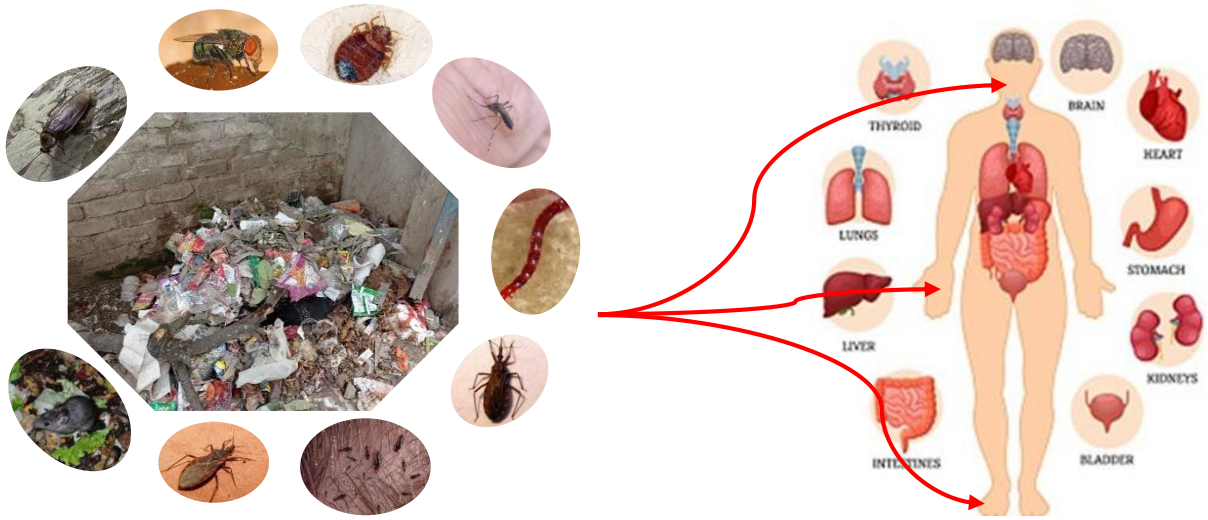
On the ground, it has been seen that the majority of teenagers are underweight, below or near five feet, and poorly cared about. According to research[47], social and demographic characteristics were most strongly connected with childhood stunting. Young men and women have reported suffering from fever and catarrh once or twice every month owing to dust and a polluted environment.

> *"Frequently my child gets sick, every month, for couple of times, I have to take him to the hospitals. Running nose and coughing are his never-ending issues, his tummy is inflated also"*
>
> **A mother, Bou Bazar Slum.**

According to the Canadian Mental Health Association[48], Mental and physical health are intrinsically intertwined. It stated that people with severe mental health disorders have an elevated chance of developing chronic physical illnesses. Similarly, people with persistent physical illnesses are susceptible to mental illness. Therefore, when people are not healthy, they are more likely to experience mental anguish, which can lead to social problems such as violence and substance abuse. Inversely, when people's physical health causes financial hardship, this can also lead to violence and drug dependence. It was found in the field that an unhealthy living environment causes mental and physical health disturbances which have a high risk of social disasters.

[46] [18]
[47] [20]
[48] [21]

4.2.3. Waste dumping zone is the ideal birth place for parasitic insects



Picture 3 How parasitic insects affect human body

Physical inspection/observations revealed the presence of an abundance of flies and mosquitoes in and around the landfills. All these feed and breed on the putrid waste. Mosquito breeding is reportedly higher within and around the landfills. Besides these, there are lots of cockroaches and mice available in these Slum areas. All these contribute to the spread of various vector-borne diseases among the inhabitants. During the summertime, the mosquito problem increases many folds such as Dengue.

People living close to the landfills also suffer from pneumonia, bronchial and skin diseases from the huge amounts of waste dumped there, as reported by study participants (respondents). Nearby dwellers also suffer from regular headaches and loss of appetite due to the foul smell.

4.2.4. Health facilities in the slums

In project slums, there were no regular health care services. The NGOs who oversee the Urban Primary Health Care Service Delivery Project operate different satellite clinics in slums on certain days of the week. FGD respondents have indicated that although BRAC conducts a variety of health-related initiatives in slums, service providers do not feel comfortable giving services while in the slums. However, BRAC organizes EPI (expanded program for immunization) service centers in the slum.

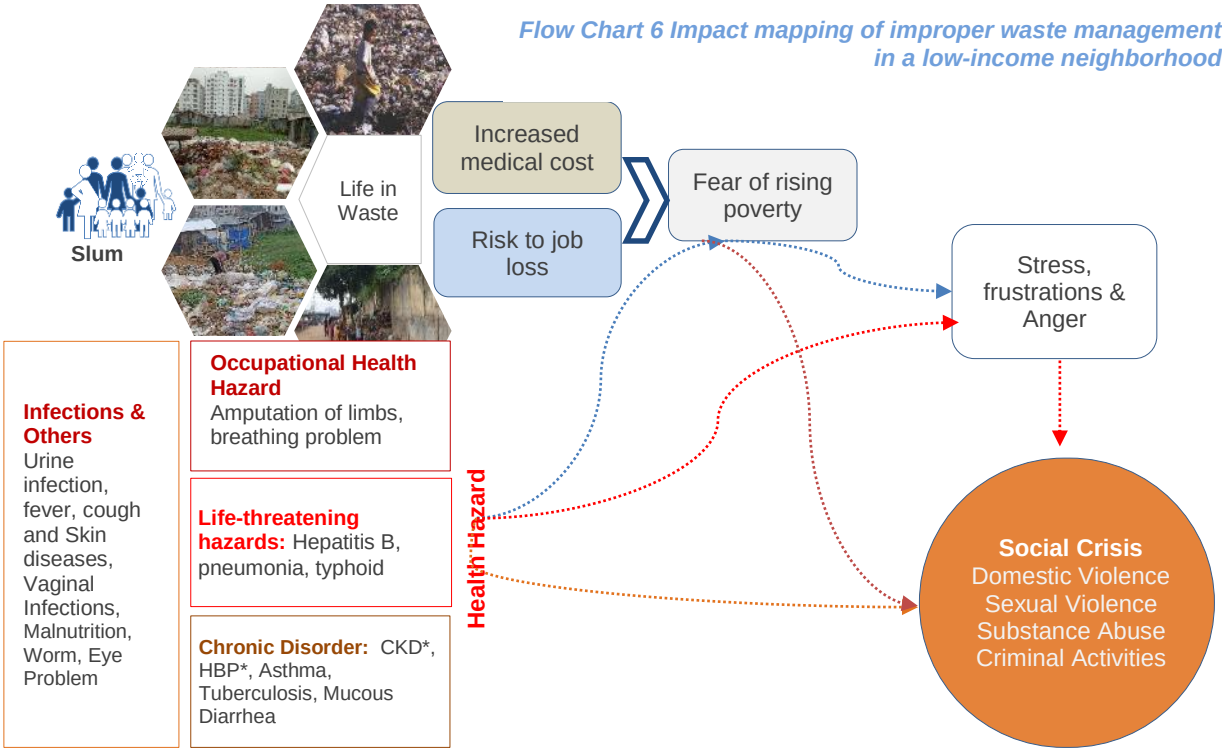
Such examples reveal the overall situation of the locations so that service providers do not feel comfortable providing their services there. This also indicates the level of accountability of service providers towards their services. In addition, due to the lack of government health services and restricted access to health service facilities, unethical pharmacists exploit the ignorance of patients. These local pharmacists are the primary service providers in these areas. Therefore, it is important to ensure that malpractices while providing medicine are eliminated or at least reduced.

> *"I got a throbbing headache. The compounder at the neighborhood pharmacy gave me these two medications. (Citalopram with Rivotril)"*
>
> **A young girl, Bou Bazar**

4.3. Risk Analysis of WMS (Health hazard, Economy, Livelihood Opportunity)

There is a serious lack of government waste management initiatives in the city's impoverished neighborhoods. The environment and surroundings of the site are significantly polluted as a result of poor waste treatment. The polluted atmosphere is harming the physical and emotional health of the inhabitants in the vicinity. In the slums and surrounding areas, inefficient waste management is causing environmental damage by polluting the air, water, and land. Even rubbish from other locations is dumped in low-income areas.

Flow Chart 6 Impact mapping of improper waste management in a low-income neighborhood



In most of the cases, respondents of FGD, KII and IDI could only name the health hazards such as fever, Mucous Diarrhea, Urine infection, loose motion, vomiting, fever, cough, skin diseases, coughs, headaches, and vaginal Infections. However, including the mentioned diseases, several researchers added, that such irresponsible practices may cause Cancer, Hepatitis B, pneumonia, typhoid, Chronic Kidney Disorder, High Blood Pressure, Asthma, Tuberculosis, Gastrointestinal complaints, Malnutrition, Worm, eye problems, Amputation of limbs, breathing problem.[49],[50],[51],[52],[53]

This is analogous to the fact that individuals in slums are unaware of the life-threatening health risks associated with improperly handled solid waste. To map the health impact of slum dwellers due to improper waste management, the study found interconnected relations between waste management with mental and physical health, and economic, social and livelihood conditions.

[49] [4]
[50] [8]
[51] [30]
[52] [29]
[53] [15]

4.3.1. Disease profiling

Due to the unclean and contaminated environment created by poor solid waste management, the mental and physical health of urban slum people is in jeopardy in both the short and long term. In the study, illnesses such as cancer, jaundice, pneumonia, typhoid, fever, catarrh, headache, and skin infection, as well as urinary tract infections, were found during the data collection phase. Similar disorders have been identified in a number of additional research. [54],[55],[56],[57],[58]

Such infections are typically induced by ingesting polluted water, lingering in the dirt for an extended amount of time, etc. Due to the unclean atmosphere, around 33% of those impacted are plagued with these illnesses. Research determined that 26 per cent of slum dwellers might be affected by these illnesses owing to contaminated water and 19 per cent waterlogging[59]. According to another survey study, urban slum inhabitants had a higher infant death rate than rural individuals. In addition, according to a report, 57 children per thousand perish in urban slums, whereas 47 children per thousand perish in rural communities.[60]

Physically and mentally challenged people are the most neglected ones in these diseases. The needs of physically and mentally challenged people to remain unmet due to poverty and a lack of knowledge among slum dwellers. In the family, they are treated as a burden. Subsequently, many of them are forced into begging. For further analysis, please Cases 4.

Table 2 - Types of diseases and effects

Types of Diseases		Health Hazard (HH)	Long Term HH	Short-term HH
Physical Health Hazard	**Birth defect and reproduction disorder**	Maternal and Child mortality, stunting, the probability to give birth immature baby, probability of children with physical and psychological disabilities, anemia, miscarriage	✓	
	Chronic Disorder	Chronic Kidney Disorder, High Blood Pressure, Asthma, Tuberculosis, Mucous Diarrhea, Diabetes	✓	
	Infections	● Urine infection ● Fever, cough and ● Skin diseases, ● Vaginal Infections ● Hepatitis B ● Dengue	✓	✓
	Occupational Health Hazard	● Ceramic chunks, broken glasses & metal objects causing cut wounds ● Skin Disease ● Vaginal Infection ● Breathing Problems	✓	✓

[54] [4]
[55] [8]
[56] [30]
[57] [29]
[58] [15]
[59] [29]
[60] [22, p. 2]

Types of Diseases		Health Hazard (HH)	Long Term HH	Short-term HH
	Other	• Eye Problem • Distaste • Worm • Malnutrition	✓	✓
Mental Health Hazard		• Stress • Anger • Violent behavior	✓	✓

4.3.2. Disparity between slums and the privileged areas

The group at risk from the inefficient disposal of solid waste include – the population in areas where there is no proper waste disposal method, especially preschool children; waste workers; and workers in facilities producing toxic and infectious diseases. The population residing near waste disposal factories is frequently poorer than the overall population, resulting in disparities between the slums and the advanced areas. Studies have revealed a correlation between local area impoverishment and proximity to incinerators and landfills[61].

We are underpaid, and neither contractor provides us with protective equipment to reduce health hazard while working in STS. They (the Contractor) are not even willing to provide us with medical assistance when we get bodily injuries on the job. Thus, we must incur higher medical expenses owing to garbage collection.

Waste Collector, Balur Maath Slum

The 'collectors' usually work on a daily wage basis employed by the local Ward Councilor, but the salary comes from the houses that pay a nominal monthly fee. A recent study revealed that for 'waste collection service, each worker receives BDT 1,000–4,000 (USD 12–47) monthly from their employer depending on their experience'[62]. As expressed in two In-Depth Interviews (IDIs), the monthly salary of the 'collectors' and sweepers ranges from Tk. 7,000 to Tk. 9,000. Even if the amount is about 7-9 thousand, this is too low to meet daily living requirements in Dhaka. Moreover, these collectors cannot purchase protective gear, nor do their contractors provide them with such equipment.

A brief interview was done with a slum resident to determine the factors that encourage garbage collectors not to routinely collect rubbish from slums. He voiced his displeasure that the funding for garbage collection in slums is inadequate that he came to know from a waste collector. When asked by the responder why garbage was not being collected from their slums and adjacent areas, a waste collector stated that slums lacked the funds to collect rubbish on a regular basis. Noting this, slum rubbish is collected once in three months.

4.3.3. Physical health hazards of pregnant and adolescent girls

It was found as per investigation that 12 to 14 households share a single toilet and bathroom. Further, unsanitary latrines are utilized by around 47 percent of slum residents63. Pregnant women and adolescent girls are the most prone to illness. Consequently, teenage females are unable to maintain adequate menstrual

[61] [26, p. 16]
[62] [19]
[63] [29, p. 6]

hygiene. In addition, pregnant women who retain their urine for extended periods commonly have a number of health issues, such as lower abdomen discomfort and urinary tract infections.

In addition, due to the odor in their surroundings, pregnant women lose their appetite which impacts the unborn child's mental and physical growth. This may cause chronic stunting, brain damage, and heart and eye damage. The Yukon government (Canadian Territory) website published an article where it mentioned that environmental exposure may harm your baby during pregnancy.[64] Please See Case 1.

4.3.4. Mental health impact on slum residents especially adolescent

The reasons for the bad mental health conditions were tried to be identified in the survey. It was found that coming from healthy and way more spacious living conditions in villages, people find it way difficult to cope-up with extremely tiny, congested, and unhealthy living environments. Besides, previous social connections and bonding suddenly fade away when they find themselves in a super competitive and arduous work environment that leaves them with no time to make new social relationships. They also feel inferior among thousands of unknown people in Dhaka city where they don't have the dignity they deserve as a human being. Moreover, it can be said that they live without any entertainment facilities for them. All these dynamics of their lives in slum areas worsen their mental health and peace.

The overall environmental situation of the slums is a stinky smell all around due to waste dumped all around, highly congested living conditions, and no means of mental support. Most end up losing sleep and young people are not able to concentrate on any issue pertaining to their life and livelihood.

Among the FGD participants, 4 out of 12 complained of having frequent headaches which they attributed to the foul-smelling air all around causing insomnia and sleep disturbances and headaches caused by poor sleeping. **A couple of the FGD respondents mentioned the lack of mental privacy which is an outcome of the improperly dumped waste and a small area with a huge congested population.** They also further mentioned that they do not have any resources or access to persons to obtain some mental support. In this regard, they suggested setting up an IT platform where they can privately raise their questions and receive counselling.

A survey conducted almost a decade ago revealed that depression had become nearly as widespread as malaria (3.2% compared to 4% of the overall illness burden), and this proportion was anticipated to rise to 5% by 2030. It also articulated, *"However, mental health issues tend to be overtaken by other health problems, especially in the rapidly urbanizing megacities of developing countries, where a growing number of people are living in slums and unhealthy environments."*[65]

Adolescents are readily influenced, especially when they are depressed. It can be caused by age, attitude, expectations, conflict, death or loss, gender or genetics. As a result, they, particularly slum teenagers, are in danger of engaging in many risky and unlawful behaviors. This may pose a substantial social threat that harms them and others.

4.3.5. Economic risk due to an unhealthy environment

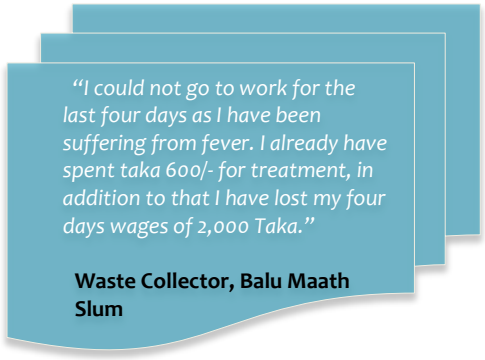
During the data collection stage, it was determined that the average income of Dhaka's slum inhabitants is between 6,000 and 15,000 BDT. Literacy rates in this low-income neighborhood are about 50 per cent.

[64] [27] [29, p. 6]
[65] [23, p. 2]

(Mahmuda Binte Latif*, p. 4). Due to their poor literacy rates, these underprivileged individuals have limited health awareness.

In addition, slum residents believe in superstitions when seeking medical care. On average, 42% of slum inhabitants sought treatment for their illness from Kabiraj. They argue that their poverty prevents them from seeing a doctor. Despite the fact that 52% of slum residents rely on government hospitals for treatment, the risk is still present since medical services are not provided at the appropriate time[66].

In this condition, marginalized individuals are not only exposed to health risks but their economic existence has also been impeded. 2015-16 research[67] done in Arichpur, Tongi, determined that a slum resident with severe diarrhea was unable to work for an average of 4.35 days, resulting in a financial loss of around BDT 2,500. (27.39 Dollars). If the diarrhea is not severe, they lose around BDT 600 each day of work. In addition, their mental health is adversely affected by a lack of appropriate therapy, which manifests itself in the form of the symptoms of new ailments.



In this study, inSights attempted to comprehend the health risks and issues faced by marginalized residents of these places. Additionally, inSights attempted to learn more about the financial and social issues that the inhabitants suffer as a result of these factors. In addition to physical health difficulties, marginalized individuals often confront mental health issues. For example, irritable disposition, unexpected rage, aggressive conduct, child and female family member abuse, etc. The interdependence between mental and physical health is evident upon casual examination. The majority of individuals from these areas are laborers. Therefore, when they are ill, their daily income diminishes. Residents living in filthy conditions are subjected to intense mental stress, which drives them to engage in family disputes, substance misuse and/or addiction.

[66] [30]
[67] [18, p. 9]

Chapter Five:

Case Story Analysis

Case No	Case Story	Case Analysis
1	**Slum environment hinders adolescent girls' MHM**	
	When discussing their Menstrual Hygiene Management, a Balur Maath slum adolescent girl revealed her utter despair (MHM). She stated that she frequently had menstrual pain. However, because every 20 to 25 slum households shared a single toilet, she was unable to clean her menstruation cloth or change her sanitary napkin at the right time. She had physical and psychological anguish throughout menstruation. This is a common phenomenon among her peers too that feel embarrassed to discard sanitary napkins in public. When she used cloth for menstruation management, drying them after usage caused her greater agony.	The story of this adolescent girl is representing the overall slum situation regarding menstrual hygiene management. Although this situation is not directly connected with waste management, it is connected with hygienic behavior and practices. Some vital issues are not addressed since, this is not an issue that can be discussed in public, nor as to the issue that people feel to address. These are; » **Disposal of used sanitary napkins** as these are high-density areas and girls do not comfortable disposing of them publicly. » The **consequence** of the above-mentioned issue is these girls dispose of their sanitary napkins here and there hiddenly. This means they might through them behind the toilet window. This may cause a further health hazard. Proper waste management may encourage them to put those used napkins into the trash disposal area. » The unhygienic situation that affects their health might cause extra burdens **like virginal infections, and itching** which this girl has experienced earlier.
2	**Hired contractors responsible for cleaning are strongly powerful and connected to councilors**	
	In a consultation meeting with CBO members, a similar statement was received - "the hired contractor by the City Corporation as powerful and closely connected to the respective ward councilors. Because of that, people responsible for cleaning and managing garbage easily get away not fulfilling their duties." CBO members expressed distress that they were not capable enough to negotiate with these contractors or the authorities. Further, authority and service providers were not ready to hear their voices, and neither they (slum dwellers) did have the access to these offices	

Case No	Case Story	Case Analysis
3	**Children frequently get sick but are overlooked by their parents due to a lack of awareness**	

A mother with three children was interviewed who lived in Mollah Slum who were 2, 4 and 5 years old. Most of the time they were physically unwell. Either experienced dysentery or worm. Fever was a very common disease for her kids and these kids experienced fever once a month. Although she did not aware of the reasons why these kids experienced such illnesses frequently, she said, these illnesses were natural. Therefore, she did not feel any urge to go to the physician. In addition to that, she was also having a dry cough and runny nose while talking with the interviewers.

The case indicates that slum dwellers lack knowledge of the causes of diseases, nor they are economically in a position to maintain proper hygienic practices.

- Since mothers did not have adequate knowledge regarding the health hazards due to improper waste management, it was observed in the field that children **played in the trashes and with the trashes.**
- It was also noted in the slums that the height and weight of slum children did not meet international standards[68]; however, researchers did not bring weight or height measurement equipment, so they estimated the children's weight and height based on their experiences.

4	**Persons with disabilities are a burden the to the families who lives in these slums**	

The physically challenged persons (an IDI with a blind and another person who cannot walk may be due to polio in their childhood) live on begging. They receive money and food items from their fellow slum dwellers. The blind person has been better off as he is the Muazeen (person who calls people to the prayers) of the mosque.

Some constructive recommendations have come from these smoky parts of society.

- They have demanded their privacy and mental health rights;
- They have proposed to establish an IT center for their queries;

[68] [1]

Case No	Case Story	Case Analysis
	He gets a small monthly salary with which he can manage his family and then can spend very little on health issues. The person who cannot walk has a brother who looks after him. He has however obtained government monthly support from the Ministry of Social Welfare, Government of Bangladesh. They mentioned that headaches are linked with sleep problems. A couple of the FGD respondents mentioned a lack of mental privacy which is an outcome of the improperly dumped waste and a small area with a huge congested population. They also further mentioned that they **do not have any place to get their questions answered and obtain some mental support.** In this regard, **they suggested setting up an IT platform where they can privately raise their questions and receive answers.**	» If they have had the chance to get work, they may be self-dependents; However, the survey revealed that none of the parents discussed or disclosed their autistic child's health and other difficulties. Since these underprivileged members of society are mostly disregarded by various authorities and other relevant parties, the impact of garbage on their health, of course is ignored.
5	**Occupational health hazard due to reluctant behavior of contractors**	
	The city corporation or the contractors hired waste collectors. But they never compensate medical for any health hazard like limbs injuries, soreness, itching, or any other health issues. Rather they used to replace them with others as in slums, unemployment is high. They never received any safety equipment while working in the secondary transfer stations or landfills.	Per the ILO Occupational Health Service Convention 1985 (No 161)[69], Occupational health services must perform activities that are adequate and appropriate to the occupational risks of the undertaking, without compromising the obligation of each employer to ensure the health and safety of the employees under his employment [Part II – Function, Article 5]. (e) advice on occupational health, safety and hygiene and on ergonomics and individual and collective protective equipment; (f) surveillance of workers' health in relation to work (i) collaboration in providing information, training and education in the fields of occupational health and hygiene and ergonomics; (j) organizing of first aid and emergency treatment; (k) participation in the analysis of occupational accidents and occupational diseases. None of the above-mentioned initiatives was heard from any of the respondents.

[69] [31]

Case No	Case Story	Case Analysis
6	**Misuses of Antibiotic may cause antibiotic resistant**	
	One male and one female interviewee stated that they often obtained antibiotics from nearby pharmacies. These were prescribed by the local pharmacy-person. Interestingly, they continued to take antibiotics until they were well. As soon as patients begin to feel better, they discontinued antibiotic treatment without finishing the full course. They did not even bother to visit a doctor for antibiotics, nor were they aware that such medications are illegal without a doctor's prescription. Not only did they apply the same strategy to themselves, but also to their offspring, regardless of the age of those youngsters.	Two alarming information were received from these two interviews. » Misuses and overdose or underdose of antibiotic. » Antibiotics are randomly prescribed by the pharmacist, not a medical doctor. Initially, it appears that there is no correlation between antibiotic overuse and good waste management. Nonetheless, there is a tenuous link between these two difficulties. Since slum inhabitants are accustomed to living in extremely unsanitary surroundings, they frequently have fever, cough, and runny nose. Antibiotics are their preferred treatment for these illnesses, although not verified by other researches. Antibiotics are freely available to those living in slums due to the fact that they may be purchased without a prescription from medical stores. Despite the fact that there are certain legal restrictions on the sale of antibiotics, these restrictions are largely disregarded. This uncontrolled use of antibiotics creates resistance in the body, which may cause significant health problems in the long term.
7	**Economic loss due to health hazard**	
	An interview was held with a waste collector who had been afflicted with wounds and a high temperature for four days. Due to his inability to join to his work, he was compelled to calculate 700 Taka worth of daily labor. Further he needed to buy 100 Taka (approx.) medicine daily to recover from his illness.	This is a regular occurrence with these garbage collectors. According to the data acquired from this waste collector, his daily cash loss is around 800 Taka. While analyzing the consequences of this cash lost, the stress of these people can cause domestic violence, substance abuse, frustration and many other socio-psychological hazards.

4.4. Impact on slums due to improper waste management

The monthly income of slum inhabitants is between Taka 6,000 and Taka 15,000, according to the report. Further investigation revealed that women in slums used to spend a substantially bigger amount of their income on monthly health expenditures ranging between Taka 1,000 and Taka 5,000 which is more than the average two-thirds of out-of-pocket expenses for health as mentioned in the national study.

The majority of the money spent by slum residents is on drugs and fees to non-graduate service providers. There are no government health outposts or facilities in the slums, and neither the LG Division of MOLGRD nor MOHFW manages these areas.

The following is the result of an increase in several sorts of illnesses:

Disease & Misuse of Antibiotics

- Excessive use of pharmaceuticals, especially antibiotics.
- Wrong treatment.
- Transmission of infectious illnesses such as tuberculosis.
- Probability of increasing in chronic diseases such as cancer, liver disease, renal diseases.

Economic Loss

- Increase in monthly health expenditures, which is sometimes unanticipated.
- Fear of losing jobs.
- Loss of productivity due to intermittent illnesses of the persons involved in support services in the affluent part of the city.
- Probability of increased violence including domestic and sexual violence.

Overall, Health Hazard

- Girls and women are significantly affected by menstruation hygiene and pregnancy challenges.
- Malnutrition Impacts on the nutritional aspects of children's growth, including stunting, malnutrition, etc.
- General degradation of mental health is contributing to an increase in drug addiction and substance misuse disorders, particularly among teenagers and young adults.
- Probability to increase violence including domestic and sexual violence.

Chapter Six:

Policy analysis and current scenario

Dhaka city has more than 5,000 slums inhabited by an estimated four million people. (Over 6 lakh slum dwellers in Dhaka: Minister, 2019), (Analysis of the Situation of Children and Women in Bangladesh 2015, December 2015, p. 17), (Hossain, February 2020). This is supported by World Bank data. Studies say that at present approximately 40 per cent of Dhaka's population are slum dwellers who are pushed to the city due to natural disasters and lack of employment facilities. Most of the migrants who come to Dhaka end up in the slums, home to an estimated 3.5 million people – 40 per cent of the city's population. Studies reveal that per capita per day of municipal solid waste generated in Dhaka City in 2007 was 0.368 kg.[70] Thus, a metro city like Dhaka with a population of 22,478,116 in 2022 (Dhaka Population 2022), generates 8,272Tons of municipal solid wastes per day under the assumption that the same amount of waste is generated per person but the population has increased several folds. It implies that the management of such a huge quantity of MSW is a daunting task.

As a part of recapitulation, the study coverage area needs to be mentioned once more.[71] Data were collected from four slum areas of Dhaka city16 which are located in close vicinity of landfills or secondary dumping stations. Moreover, part of these areas does not have access to dumping stations – leaving "through anywhere in the vicinity except my backyard" as the only option for MSW disposal. The study revealed that out of all four MSW (including hazardous and non-hazardous wastes) disposal systems, landfill is the only option practiced in Bangladesh including Dhaka City (DNCC and DSCC).

Review of the different relevant policies: A quick look through

At the very beginning of the study, the Team quickly looked through the different relevant Policies/Acts/*Rules* related to municipal waste management (MSW) and associated issues. Rules are usually circulated by the respective Ministry of the Bangladesh Government providing instructions on how to implement certain policies/laws or Acts.

Policies & Laws	Observation	Review & Overall Analysis
According to Dhaka Municipal Ordinance 1983, Dhaka City Corporation will work on the collection, removal, and disposal of garbage. The city corporation is	City Corporations are working a lot on waste collection and disposal, but work on waste collection and disposal in the slum areas is not adequate.	- Due to these reasons, the environment around the slum areas is dirty and unhealthy. Moreover, drains around slum areas have been blocked due to a lack of proper maintenance. As a

[70] https://www.researchgate.net/figure/Per-capita-generation-of-wastes-in-six-major-cities-of-Bangladesh-Alamgir-and-Ahsan_tbl1_280935703

[71] (i) Molla slum, (ii) Korail slum, (iii) Hazaribagh Balur Maath slum and (iv) Hazaribagh Bou Bazaar slum.

Policies & Laws	Observation	Review & Overall Analysis
also responsible for the sewerage system, chemical waste management, medical waste management, brick kiln waste, unwanted waste on city streets, and cleaning of drains.		result, waterlogging occurs in those areas when it rains. In addition, people get infected by various diseases from waterlogging.
Local Government (City Corporation) Act 2009 *60th law enacted in 2009.*	This law talks about the development, area, roles and responsibilities of the Mayor and the Ward Councilors. The Councilors were earlier used to be called Commissioners. In defining the roles and responsibilities of the Mayors and Councilors there is no mention of the Municipal Waste Management.	
Dhaka City Corporation Ordinance, 1983- There is a provision for a fine of up to BDT 50 to BDT 10,000 for littering in public space.	There is no specific place for dumping waste in slum areas. As a result, slum dwellers frequently throw waste around their houses, in drains, or everywhere.	To implement this law in the slums it is important to create an environment that encourages them to practice this good habit. On the one hand, arrangements can be made for waste collection. Whereas, initiatives can be taken to make the slum dwellers more aware of this issue.
The Environmental Policy 1992 states that no industrial or agricultural waste may be discharged into rivers, ponds, or drains. The law also discourages the transportation of garbage in open garbage trucks in the daytime.	1) Waste collection vehicles have lids but are not airtight. 2) In addition, most of them do not have lids due to a lack of proper maintenance. 3) As a result, these vehicles cause air pollution and a bad smell. 4) Waste collection vans have no lids too. 5) Residents living close to the slum areas dump their daily waste into the nearby canals or drains.	1) The first rule to implement any law is to have a strong monitoring system. However, there is a lack of a strong monitoring system in waste management. 2) Lack of awareness among waste collectors is also observed in these cases. They are also unconcerned in this regard. 3) Lack of awareness among the slum dwellers is being identified, leading to environmental pollution and littering everywhere.

Policies & Laws	Observation	Review & Overall Analysis
According to the ***Urban Management Policy Statement of 1998***, municipalities may enter into agreements with third parties for waste disposal, public sanitation, drain and road cleaning, and maintenance.	1) Under this law, City Corporation collects waste from the wards through third-party agreements. Still, no regular initiatives are taken to collect waste from the slum areas. 2) The health care of waste collectors are ignored by the concerned organizations.	1) There is no strong monitoring system for the waste collection process. As a result, red, orange, and green categories are not followed in a collection system. 2) Waste collectors do not take any initiative by themselves to ensure their health care. As a result, the health risk from the waste stays the same.
The Bangladesh Environment Conservation Act 1995 is an important document enacted as 1 Law of 1995.	This has details about environment conservation, quality of environment maintenance, pollution control and prevention. It is a detailed document of the roles and responsibilities of the government officials at different levels connected with environmental work.	
Environment Conservation Rules 1997 – mostly categorized industrial, housing and commercial waste as red category depending on some specifications. Hence, these landfill projects must have a No Objection Certificate.	By talking to waste collectors, it is learned that categorized waste collection is not maintained. The collected waste from the households is directly dumped into the secondary transfer station. The chance of categorizing the waste from the STS is impossible. The carcasses of the animals are left open in the dustbins.	A few days ago, plastic containers of different colors were distributed to the city dwellers to collect waste by Dhaka City Corporation. Those containers have been used for some time but now they are not seen anywhere. Relevant campaigns can be run to raise awareness on waste management among the city dwellers as well. Steps must be taken to regularize this campaign.
Solid Waste Management Rules 2021 This is in accordance with the Bangladesh Environment Preservation Act 1995, sub-clause 20.	1) These rules have suggested that basic principles for waste management should be followed accordingly. 2) The responsibilities of waste generators and users, the responsibilities of the organization, the responsibilities of the manufacturer or importer of goods, the responsibilities of the local	No specific guidelines have been formulated officially on how the Solid Waste Rules 2021 will be implemented. This Rule was enacted after the strong advocacy role played by the Dhaka Calling project. This Rule has a sufficient explanation of the different words used, and stages of solid waste management. In 18

Policies & Laws	Observation	Review & Overall Analysis
	government authorities, the responsibilities of other authorities, the formulation of action plans, penalties, etc. are mentioned.	pages it lays out what needs to be done at the planning stage including raising awareness regarding waste management, then at the point of waste generation, segregation, treatment, recycling and reuse, and disposal including landfills. There is a big missing point and that is the guidance for the common people regarding waste management.

It is very interesting to note that none of the Acts and Rules mentions issues pertaining to Health or any responsibility of the MOHFW or the Directorate General of Health Services as to providing guidance and support of any whatsoever.

InSights as a part of the Dhaka CALLING Consortium in association with the other partners are involved in different advocacy activities regarding municipal waste management. In this connection, they submitted an advocacy memo dated 12 December 2021 to the Chairman of the Bangladesh Parliamentary Standing Committee on Environment, Forest and Climate Change and have been pursuing this in a very systematic way. They have been holding public hearing sessions where the slum dwellers, particularly the adolescent, youths, women and elderly persons have been attending and raising their voices. In these public hearing sessions, many MPs have been attending.

Chapter Seven:

Discussion and Recommendations

Discussion

This study described the overall scenario of Dhaka slums of the two City Corporations and the adjacent landfills using qualitative and spatial techniques. It explored the environmental and health effects of the Hazaribagh Bou bazaar and Hazaribagh Balu Maath slums, Molla slum and Korail slums. The slums were established on landfills which have been created by the dumping of municipal solid waste. The inclusion of such wider thematic areas differentiates it from other studies while adding to the existing growing literature on landfills and Secondary Transfer Stations waste treatment/management and slums.

We could not find any Bangladeshi study looking into the health aspects and consequences of managing or linked with municipal solid waste. The slum population is gradually increasing. Hence, the health issues of vulnerable populations are an area that needs due attention.

A lack of proper waste management practices was revealed at the Hazaribagh slums and the adjacent landfill due to a lack of adequate land availability. The absence of proper waste treatment, the presence of putrid odors and mosquitoes, flies and other rodents increase the risk of health ailments among the surrounding people. Adverse environmental effects are being caused by the release of pungent and toxic gasses into the atmosphere which poses serious public health threats.

However, proper segregation, recycling, composting and incineration are positive steps toward effective waste management as well as decreasing the quantity of waste, which may substantially create an enabling environment for reducing the aforementioned health hazards.

The findings reveal that the existing SWM practices in Dhaka city can potentially become better organized and effective. The existing waste management system requires modification to ensure environmental sustainability and equitable public health. To reduce the waste quantity at the landfill, better primary waste disposal practices are needed. It is imperative to increase awareness among the people about the adverse effects of the uncontrolled dumping of solid waste through the formal and social media as well as advocacy movements at national as well as local levels. Imposing penalties due to improper MSW management practices can also be a suitable approach,

The organizational capacity of the landfills must also be improved, through sufficient technical and manpower support and ensuring enough budget allocation for proper MSW management procedures. While it is necessary to increase the landfill land area, waste generation growth due to the increasing urban population will exhaust the additional land in five to seven years. The waste treatment and recycling process must be waste reductive and adapted according to waste disposition.

Alternative practices of municipal waste management such as institutionalized incineration in treatment plants and the creation of refuse-derived fuel (RDF) should be explored especially for bringing positive environmental and health impacts to the slums. Only the residue waste after composting and burgess conversion should be disposed of and dumped at the landfills. Thus, in the landfill areas, more greenery could be thought about.

Keeping in mind the health outcome and impact of municipal waste management, very distinctively two steps could be taken immediately. Firstly, the health awareness among the slum population can be raised and their illnesses are addressed through a joint effort of the LG Division of MOLGRDC and MOHFW with input from the CSR source of the private sector. In this, there shall have to be a strong community engagement. Secondly, a multi-stakeholder, multi-Ministry strategic plan be developed with the LG Division of MOLGRDC in the lead. However, the involvement of the Prime Minister's Secretariat can speed up the implementation of any long-term plan.

Recommendations

Urban waste management strategies must take full account of the complex interactions that occur with a variety of urban systems. The policies and practices of urban waste management can have negative environmental and public health impacts. This study concludes that residents living near the two studied Dhaka STS sites out of the four slums face higher environmental and health risks. Although these STSs have improved during the last few years, significant improvement is needed for the landfills to treat the waste in a sustainable and healthy manner. This evidence can assist Dhaka's urban decision-makers, MoLGRD&C, developing agencies as well as donor community and other stakeholders in understanding the imperatives for improving MSW management and sustainability.

The different kind of stakeholders is responsible for the diversified actions. For instance, the authority may introduce a policy and monitor the policy implementations. Nonetheless, NGOs can initiate awareness-building actions and create an enabling environment for accessing services. Slum-level CBO can volunteer the initiatives to make the entire actions sustainable.

For Policymakers

- In the existing Acts, Policies, and Rules regarding waste management, particularly the one circulated by the Ministry of Environment, Forest, and Climate Change, Government of Bangladesh, there is no indication of any work or activity to be conducted on the health effects of waste handling, waste management, or living near waste dumps and landfill. Inclusion of health-related recommendations in all Acts, Policies, and Rules is essential.
- The Ministry of Health and Family Welfare (MOHFW) and the Directorate General of Health Services (DGHS) shall collaborate on the drafting of the directives to be integrated into the various Acts and Rules.
- Together with the MOLGRDC employees, the DGHS supervisory staff in urban areas shall be responsible for conducting joint monitoring of Health directives.
- The Acts, Policies, and Rules should be changed to ensure that the slum population has access to and receives health care, in particular. The Government should give high emphasis on the production of RDF (refuse-derived fuel) as an effective means of managing municipal garbage, which will lead to the construction of a green environment.
- The Local Government Institutions (Mayor and Ward Councilor), the Parliamentary Standing Committee on Environment, Forest and Climate Change, the Local Government Division of MoLGRD&C, officials of MOHFW both of DGHS and DGFP, Ministry of Social Welfare, and Ministry

For Policymakers

of Education should develop a concerted strategy and plan to address the issues related to MSW and the people living in the slums which have developed mostly on the landfills by the MSW.

- A huge amount of solid waste and fecal sludge is being generated. This needs a concerted effort by multiple Ministries including both the wings of MOHFW jointly with MoLGRD&C to plan an equitable and accessible waste management Action Plan;
- Authorities need to address the ILO conventions that were vowed by the state. Strengthen the monitoring system to follow up on whether the contractor organizations are proceeding with all the safety precautions during waste collection, segregation and disposal.

For NGOs & Private Sector

- Efforts must be made to raise awareness of the Public Health implications of all waste issues.
- Household members should be made more aware of the need for waste segregation at the point of generation. Increased awareness would also facilitate community participation in proper trash management.
- Long-term research should be commissioned to determine the effects of all harmful elements of trash on health, focusing on pregnant women, children, the elderly, and individuals with disabilities.
- Mental health problems appear to be quite prevalent among slum dwellers, particularly among youths and adolescents, as a result of a number of interrelated factors, including the stench of the slums, which has resulted from improper waste management; a lack of mental privacy; and numerous types of illnesses. Initiate telemedicine or counselling services in order to treat mental health concerns with the priority they merit.
- Engage youth and slum dwellers in different actions for a clean and healthy living environment.
- Further combined research may launch to get a clear scenario of the waste management and health impact.
- NGOs can initiate a pilot on how to ensure waste management without hindering any of the related parts.

For Community

- None can be able to ensure providing a clean and healthy living environment if the individual does not want and act accordingly. Hence, people who live in these unhealthy environments need to act in terms of clearing their household and surroundings.
- Household members should be made more aware of the need for waste segregation at the point of generation. Increased awareness would also facilitate community participation in proper trash management.

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Annexure I – FGD/IDI/KII Questionnaire

Consent Statement

অংশগ্রহণকারীর পুরো নাম	***স্থান***			
তারিখ	***সময় শুরু***		***সময় শেষ***	
ঘোষণা				
আমি নিশ্চিত করছি যে, এই সঞ্চালকের নির্দেশিকাটি গবেষণার জন্য আমার কাছে সরবরাহকৃত গাইডলাইন এবং নির্দেশাবলী মেনে করা হয়েছে। আমি বুঝতে পেরেছি যে, সাক্ষাৎকারের সময় আমাকে দেওয়া তথ্য অবশ্যই গোপন রাখা হবে।				
সাক্ষাতকারীর নাম ও পদবী :..... সাক্ষাতকারীর স্বাক্ষর ও তারিখ :.....				

ভূমিকা

আমার সাথে কথা বলতে রাজী হওয়ার জন্য আপনাকে ধন্যবাদ। আমি (নাম) ও ইনসাইটস-এর পক্ষ থেকে একটি গবেষণা করার উদ্দেশ্যে আপনার সাথে কথা বলতে চাই। আজ আপনার/ আপনাদের সাথে কথা বলতে আসার উদ্দেশ্য সম্পর্কে একটু ধারণা দেই।

ঢাকার বস্তিগুলোতে ময়লা ব্যবস্থাপনার অবস্থা খুবই খারাপ। ময়লার সুষ্ঠ ব্যবস্থাপনার অভাবে ঢাকার বস্তিবাসীদের শারীরিক স্বাস্থ্য যেমন ক্ষতিগ্রস্ত হয় তেমনি মানসিক স্বাস্থ্য মারাত্মকভাবে বিপর্যস্ত হতে পারে। আবার অসুস্থতার কারণে বস্তিবাসীকে গুণতে হয় বড় অঙ্কের চিকিৎসা ব্যয়। এসব বিষয়গুলো আরও ভালভাবে জানতে আমরা ঢাকা কলিং প্রকল্পের আওতায় ৪টি বস্তিতে কাজ করছি। সেগুলো হলো, মোল্লার বস্তি, কড়াইলের বস্তি, বউবাজার বস্তি ও বালুর মাঠ বস্তি। এসব শারীরিক ও আর্থিক ক্ষতি কমিয়ে আনতে এবং এলাকার ময়লার সুষ্ঠ ব্যবস্থাপনা নিশ্চিত করতে আপনাদের উদ্যোগ সম্পর্কে জানবো। পাশাপাশি এ ধরনের বর্জ্য অপসারণে সরকার ও এনজিওগুলো কী ধরনের উদ্যোগ নিতে পারে সে বিষয়েও আপনাদের গুরুত্বপূর্ণ মতামত আমাদের গবেষণাকে সমৃদ্ধ করবে।

অনুমতি সাপেক্ষে আমরা আপনার/আপনাদের কথা রেকর্ড করতে চাই। যেন আপনাদের দেওয়া সব গুরুত্বপূর্ণ তথ্য, অভিজ্ঞতা ও সমস্যা সমাধানে আপনাদের পরামর্শগুলো আমরা গবেষণায় নিখুঁত ও সঠিকভাবে তুলে আনতে পারি।

আমি প্রতিষ্ঠানের পক্ষে আপনাদের নিশ্চিত করছি গবেষণার কোনো পর্যায়ে কোনো অবস্থাতে আপনাদের নাম, পদবী, ঠিকানা বা আপনাদের পরিচয় প্রকাশ করা হবে না। ধারণকৃত বক্তব্য গবেষক ও গবেষণাকারী প্রতিষ্ঠান ছাড়া আর কারো কাছে হস্তান্তর করা হবে না। ধারণকৃত বক্তব্য কেবলমাত্র প্রতিবেদনের স্বার্থে ব্যবহৃত হবে।

এই গবেষণায় আপনার অংশগ্রহণ সম্পূর্ণ ঐচ্ছিক। কেউ বা কোনো পক্ষ গবেষণায় অংশগ্রহণ করার ক্ষেত্রে আপনাকে কোনো ধরনের চাপ প্রয়োগ করেনি। আপনি যে কোনও সময় গবেষণায় অংশগ্রহণ বন্ধ করতে পারেন। এই গবেষণার ক্ষেত্রে ইনসাইটস্ বা গবেষক আপনার সাথে কোনো ধরনের আর্থিক লেনদেনের প্রতিশ্রুতি দেননি।

এই সাক্ষাৎকার সম্পর্কে আপনার আরও প্রশ্ন আছে? (প্রয়োজন অনুসারে বর্ণনা করুন)। আপনি কি সাক্ষাৎকার দেওয়ার জন্য আপনার সম্মতি দিচ্ছেন? যদি হ্যাঁ, তাহলে নিম্নোক্ত প্রশ্নসমূহ করুন।

Focus Group Discussion & In-depth Interview

SECTION: A
DEMOGRAPHIC INFORMATION

A. Name: ……	**B.** Age:
C. Sex: ☐Male ☐Female ☐Other ……	**D.** Any Disability: ☐Yes…….... ☐No
E. Marital Status : ☐Single ☐Married ☐Divorced ☐Widowed ☐Not interested to mention	
F. Education : ☐i-ii pass ☐iii-v pass ☐vi-viii pass ☐ix-x pass ☐SSC ☐HSC ☐Graduate and above	
G. Occupation: ……	
H. Household Income : ☐1K-2K ☐2K-5K ☐5K-10K ☐10K-15K ☐15K-20K ☐20K & above	

SECTION: B
HEALTH HAZARDS DUE TO IMPROPER WASTE MANAGEMENT

Sl. No.	QUESTIONS
1	What kind of diseases have you and your family experienced in the last six months?
2	What do you think about being affected by these diseases?
3	What steps have you taken to prevent these diseases?
4	Where do you often visit for the treatment of these diseases?
5	What hardships does a pregnant woman face due to improper waste management?
6	What kind of mental have you and your family experienced in the last six months?
7	How did you/ your family member overcome such psychological distress? Did you / your family member ever discuss about it? Did you provide any solutions?
8	What persuasions can be taken to avoid further distress or depression?

SECTION: C
MENSTRUAL HEALTH MANAGEMENT IN SLUM AREAS *(ONLY FOR WOMEN AND GIRLS)*

9	What kind of problems do you face during menstruation? And how do you deal with that?
10	What kind of mental health hazards do you face during menstruation? And how do you deal with that?

SECTION: D
HEALTH HAZARDS OF "*PREGNANT WOMEN*" IN SLUM AREAS DUE TO IMPROPER WASTE MANAGEMENT

11	What problems do you face as a pregnant woman due to improper waste management?

SECTION: E
ECONOMIC RISKS

12	What kind of financial loss do you have to encounter due to physical illness caused by waste mismanagement?

SECTION: F
GOVT. INITIATIVES TO REMOVE WASTE FROM SLUMS

13	What steps are being taken by the government to solve the problem of waste mismanagement in the area?

SECTION: G

RECOMMENDATIONS

14 What initiatives you might take to address the waste mismanagement issue? What can a local NGO do? How about the government?

Key Informant Interview

		Physician	Personnel (City Corpor)	Ward Commissioner
1	What are the health hazards (mental and physical) usually slum people experienced? Is there any relationship between such health hazards and unhealthy environment where slum people live in?	√	√	√
2	How did you handle these issues?	√		
3	What kind of initiatives do you take to address the waste mismanagement issue?		√	√
4	Do you face any hardships in taking those initiatives? If yes, how can you or the government play a role to meet those hardships?		√	√

@Dhaka CALLING Project

inSights - Institute of Innovations for Gender and Humanitarian Transformations
1/11, Iqbal Road (3rd floor), Mohammadpur, Dhaka - 1207, Bangladesh.
Phone: +880-(0)1911-478 566
Email: insights.dhk@gmail.com
Website: www.insightsbd.com

DSK- Dushtha Shasthya Kendra (DSK)
House- 741, Road- 09, Baitul Aman Housing Society, Adabor, Dhaka- 1207, Bangladesh.
Phone: +880-2-48115079, +880-2-55010253, +880-2-58153413
Email: dskinfo@dskbangladesh.org
Website: www.dskbangladesh.org