

**ASSESSING CLIMATE VULNERABILITY AND RESILIENCE AMONG URBAN
FEMALE ADOLESCENTS: A STUDY IN DHAKA'S KORAIL SLUM**

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A thesis submitted to the Department of Architecture in partial fulfillment of the
requirements for the degree of Master in Disaster Management

Postgraduate Programs in Disaster Management (PPDM)
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Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate reference.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.



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Approval

The thesis titled “**Assessing Climate Vulnerability and Resilience Among Urban Female Adolescents: A Study in Dhaka’s Korail Slum**” submitted by Md. Abu Syed Student ID:18368001 of fall, 2022 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Master in Disaster Management Date.

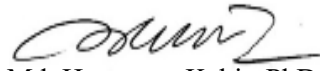
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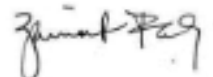
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Ethics Statement

The entire study was conducted with ethical competence and integrity, considering social, economic, and ecological effects in addition to legal requirements when making decisions and acting responsibly. First and foremost, consent was taken from each community and individuals in the survey areas while conducting surveys. Firstly, the purpose of the study was explained to the participants of the survey. Secondly, other actions such as taking photographs and recording respondent answers occurred with permission from the concerned people.

Throughout the data analysis and findings, each respondent was given a unique identification number, maintaining their anonymity throughout the study. There was no activity in the study that could reasonably have been expected to cause discomfort or risk for participants.

The entire research process, from formulating the research questions to arriving at study conclusions, was carried out impartially. The overall research design, data analysis, and representation were conducted without any bias or inclination.



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Abstract

Access to safe and clean water is a critical challenge in the saline-affected coastal areas of Bangladesh, particularly during emergencies such as natural disasters. Rising sea levels, storm surges, and cyclones frequently cause salinity intrusion, contaminating freshwater supplies and exacerbating water scarcity, thereby posing a threat to public health. Conventional water delivery systems are often disrupted, leading to an increase in the incidence of waterborne diseases among local communities. Without prompt intervention, communities may resort to using contaminated water sources, resulting in health issues and socioeconomic stress.

In this regard, this study aims to assess the coverage and effectiveness of existing clean water interventions in the study area during emergencies, evaluate people's knowledge, attitudes, practices, affordability, and choices regarding these options, and identify the gap between policy and practice regarding safe water options in saline-prone coastal areas. To conduct this research, a cross-sectional study was designed using a mixed-methods approach, incorporating both quantitative and qualitative methods. In this regard, both primary data collected through questionnaires, key informant interviews, focus group discussions, and secondary data, sourced from relevant literature, journal articles, and government reports, are used here. Stratified random sampling for quantitative approach and purposive sampling for qualitative approach are employed to conduct the research.

The study finds that access to safe water during emergencies is significantly hindered due to the limited efficacy of essential water technologies, including rainwater harvesting systems (RWHS), Pond Sand Filters (PSFs), and desalination plants, which often malfunction during disasters caused by salinity intrusion, flooding, infrastructure damage, and power outages. More than ninety-nine percent of respondents indicated a scarcity of potable water during emergencies, with women and children disproportionately burdened by the necessity of retrieving water from extensive distances. Notwithstanding the presence of community initiatives like rainwater harvesting and desalination plant, these efforts are hindered by insufficient knowledge, poor maintenance, and limited institutional support.

Despite the prevalence of waterborne infections, numerous individuals refrain from pursuing clean water. Although non-governmental organizations (NGOs) significantly contribute to the establishment of water infrastructure, over fifty percent of these systems become nonfunctional during disasters. A comprehensive strategy should be formulated that incorporates implementing hybrid and climate-resilient water infrastructures, safeguarding freshwater sources, investing in mobile desalination units, enhancing community training and disaster committees, and undertaking initiatives to improve infrastructure and multi-stakeholder coordination to ensure sustainable and equitable access to safe water during emergencies.

Keywords: Climate resilience, climate change, urban climate resilience, vulnerable teenagers.

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CHAPTER ONE

Introduction

1.1 Background of study

Bangladesh is regarded as one of the most susceptible nations to the effects of climate change due to its unfavorable geographic position, low-lying terrain, high population density, poverty, and livelihoods reliant on the climate (Huq and Ayers, 2007; Rahman et al, 2011). The scientific community widely agrees that climate change is an established fact. The Intergovernmental Panel on Climate Change (IPCC) has determined that anthropogenic activities are altering the climate system and will continue to do so in the future. The increase in surface temperatures over the past century is increasingly manifesting its effects on both physical and biological systems. Climate change is likely to increase the frequency and severity of extreme weather events, including floods, storms, and droughts. Failure to implement sufficient measures will result in climate change ramifications affecting future generations, notably impacting the impoverished (Khan, 2010). This occurs despite the discrepancy in estimates concerning the precise quantity, rate, and spatial patterns of climate change.

Bangladesh is one of the largest deltas in the world, which is highly vulnerable to natural disasters because of its geographical location, flat and low-lying landscape, population density, poverty, illiteracy, lack of institutional setup, and so on (Johnson et al., 2009). Over recent decades, when compared among the countries of the global south, Bangladesh has experienced a significant number of climatic events due to its location on the Bay of Bengal, the effects of which have been worsened by its funnel-shaped deltaic coastal landscape (Malak et al., 2020). However, the adverse effects of climate change – especially high temperature, sea-level rise, cyclones and storm surges, salinity intrusion, heavy monsoon downpours etc. has aggravated its overall economic development scenario to a great extent (Biswas, 2013).

Urban populations globally are encountering heightened risks due to the climate change, particularly evident in developing countries like Bangladesh, where the impacts of climate change are more exacerbated by poverty, ineffective urban planning, and insufficient infrastructure. Dhaka, the capital city of Bangladesh, is one of the fastest-growing megacities in the world. The city is affected by climate change primarily in two ways: flooding caused by torrential rainfall and drainage congestion, and heat stress. High levels of vehicle exhaust emissions, industrial activity

in the city center and the increased use of air conditioning are the main factors causing this heat difference in Dhaka (Alam & Rabbani, 2007). However, the most devastating impact of its climate variability in recent years is flooding, which has increased due to a combination of inadequate infrastructure and the destruction of natural water bodies (Yahya et al., 2010). The individuals who are most vulnerable to the effects of climate change are those who reside in regions that are prone to hazards and who have the least ability to prevent the direct and indirect effects of natural catastrophes (Huq et al., 2007). This group's members usually don't have decent dwellings, sanitary facilities, or drainage systems. They are unable to relocate to less dangerous areas, change careers if a climate hazard jeopardizes their livelihoods, or afford to access prime service land in the city due to its exorbitant cost. Accordingly, low-income populations are particularly at risk from climate change, particularly those who inhabit in urban informal settlements, which often have subpar housing as well as inadequate drainage and sanitation systems.

Dhaka, the capital of Bangladesh, has a population of 14 million and an annual growth rate of 4.4 percent, making it one of the most unplanned metropolitan centres globally (UN-HABITAT, 2009). Dhaka is the most rapidly growing megacity globally. The expected impacts of climate change on this city, together with the potential for disaster it presents, are profoundly daunting. Experts believe that the melting of glaciers and snow in the Himalayas, coupled with increased rainfall due to climate change, will lead to a rise in flooding in Bangladesh, especially in coastal towns and the delta region, including Dhaka. Dhaka may see elevated temperatures due to increased car exhaust fumes, heightened industrial activity, and greater use of air conditioning. As a result, the urban impoverished are especially vulnerable to the impacts of climate change due to the unstable infrastructure of slums and informal settlements, the lack of sanitation services, and the absence of work security (Khan, 2010)

The fast urbanization in this metropolis has led to the emergence of informal settlements, such as the Korail Slum, where vulnerable populations, especially women and adolescents, face heightened climatic risks (UN-Habitat, 2016). Urban slums, often marked by overcrowding, limited access to clean water, and insufficient sanitation, are especially susceptible to climate-related hazards such as flooding, heatwaves, and water scarcity (Rahman et al., 2018). In urban slums, adolescents, especially females, represent a demographic that is notably vulnerable. The socio-economic marginalization of these persons is not the sole factor contributing to their

vulnerability; gender-based disparities in education, mobility, and access to information and resources also contribute (Ahmed et al., 2019). Nevertheless, the adolescent girls possess the capacity to be significant agents of change and resilience when they can afford appropriate education and support systems well. To build inclusive urban climate adaptation policies, it is essential to comprehend their current knowledge of climate change and their capacity for resilience. Access to education, healthcare, social networks, and economic opportunities enable these girls to confront and adjust to the impacts of climate change. Conversely, there is a dearth of research about how female adolescents residing in the urban slums of Bangladesh perceive the climate change and how they cultivate resilience at either the community or the individual levels.

1.2 Statement of the problem

The urban slums in Bangladesh are increasingly vulnerable to climate change, encompassing floods, heatwaves, waterlogging, and other extreme meteorological phenomena. These environmental risks disproportionately impact on marginalized people, particularly teenage girls, who face distinct issues stemming from gender inequality, poverty, and insufficient access to education, healthcare, and information. Adolescent girls in urban slums, despite their susceptibility, are frequently marginalized in climate change discussions and resilience-building efforts, resulting in a significant deficiency in both policy and practice (Ahmed et al., 2019). Women are generally more vulnerable to climate change than men because they make up the majority of Bangladesh's poor, with over 50 percent of women living below the national poverty line (Kabir, 2024). Moreover, their vulnerability is exacerbated due to existing gender inequalities and socioeconomic factors. They are particularly impacted by urban slums, where inadequate infrastructure, poor sanitation, and lack of essential services exacerbate their struggles.

Climate resilience encompasses not just technological aspects but also social, physical, and economic characteristics that empower individuals and communities to foresee, endure, and recuperate from climate-induced disruptions (Boehm et al., 2022). For adolescent females, resilience is contingent upon their awareness of climate challenges, access to supporting networks, and capacity to engage in decision-making. Nonetheless, there is a paucity of empirical research about the degree to which female adolescents in urban informal settlements comprehend climate change or are equipped to address its repercussions.

Bangladesh has advanced in national climate policy; nevertheless, these initiatives frequently neglect the lived experiences and adaptive capacities of vulnerable populations, including adolescent girls (UN-Habitat, 2016). In Korail, a prominent and densely populated slum in Dhaka, female adolescents often encounter numerous intersecting vulnerabilities, such as early marriage, restricted mobility, school dropout, and inadequate health, all of which impede their capacity to address environmental stress (Rahman et al., 2018). This study aims to address the deficiency of data and comprehension regarding the climate change awareness and resilience capacity of urban female adolescents in high-risk slum regions. In the absence of such data, climate adaptation strategies would persist in marginalizing a vital part of the population, hence undermining the overall efficacy of urban resilience initiatives. This study seeks to enhance inclusive and effective climate resilience planning in urban Bangladesh by assessing the awareness levels and adaptation strengths of these young women.

1.3 Rational of the study

Bangladesh has been categorized as one of the most climate-vulnerable countries globally due to its geographical, social, and economic characteristics (IPCC, 2022). However, climate change has become a paramount concern for developing countries, with Bangladesh identified as one of the most vulnerable nations. In large metropolitan areas, especially Dhaka, the impacts of climate change are exacerbated by fast unplanned urbanization, elevated population density, and the proliferation of informal settlements such as the Korail Slum. This is particularly accurate in Dhaka. These locations are more susceptible to events such as flooding, waterlogging, and heatwaves, which exert significant pressure on the already vulnerable populations.

Adolescent girls in urban slums are socially disadvantaged and heavily influenced by their environment. Environmental immersion, gender discrimination, autonomy restrictions, poor education, and poor living conditions contribute to their disadvantaged situation. Although they are deeply affected by climate change, adolescent females are rarely included in academic research and policy conversations. Policymakers, NGOs, and urban planners cannot create gender-responsive and inclusive adaptation plans without factual data on this population's views on climate change and their adaptation methods. It is also important to note that resilience is often highlighted in climate adaptation frameworks from a structural or economic standpoint. This strategy ignores psychological, social, and emotional resiliency in adolescents, especially girls.

The fact that resilience is sometimes underestimated is explored here. In contrast, little is known about how these components interact in urban slums, where adolescent girls lack resources and opportunity since urban slums lack resources and possibilities. The urgent need to fill the information gap prompted this study to assess the climate change awareness and resilience of underprivileged female teenagers in Korail Slum. To fill the knowledge gap, the study analyses knowledge, coping techniques, and social contexts to determine climate change response limits and opportunities. This study also highlights how adolescents, with information and assistance, can increase community-level resilience measures.

Understanding the experiences and perspectives of these young girls is crucial for attaining sustainable urban development and for aligning local initiatives with global commitments, particularly the Sustainable Development Goals (SDGs). This research will contribute to a more inclusive and intersectional climate adaptation strategy within the urban environment of Bangladesh. It will underscore the importance of integrating gender and age considerations into both policy and practice.

1.4 Significance of the study

The results of this study are noteworthy from both an academic and practical perspective, especially considering the increasing climate-related threats impacting rapidly urbanizing areas like Dhaka, Bangladesh. This research addresses a significant deficiency in climate change discourse, policy, and planning by focusing on a demographic that is both highly vulnerable and under-represented: urban female adolescents residing in informal settlements. Its significance is rooted in its illumination of the perspectives, awareness levels, and lived experiences of adolescent girls residing in slums. These individuals are often overlooked in climate change research. The predominant focus of existing studies and adaptation frameworks is on adults or general community-level data, neglecting the specific vulnerabilities faced by teenage girls due to age, gender, and socio-economic marginalization. This research amplifies the perspectives of a crucial demographic and emphasizes their capacity as catalysts for transformation within their communities by examining their comprehension of climate change and their ability to adapt to it.

Secondly, the findings of this study will provide decision-makers, non-governmental organizations (NGOs), and urban planners with valuable insights. By acquiring a more profound understanding of how young girls perceive and respond to various climatic stressors, it becomes feasible to

formulate intervention strategies that are more inclusive, equitable, and focused. Frequently, programs aimed at enhancing urban climate resilience neglect to consider the needs of youth, especially the need of females residing in slums. Its findings may enhance the creation of gender-sensitive educational efforts, community resilience programs, and climate adaptation measures tailored to the realities of marginalized urban youth.

Thirdly, our research contributes to the growing corpus of literature on gender equity and climate justice. It aligns with international development objectives, specifically the Sustainable Development Goals (SDGs), notably SDG 5 (concerning gender equality), SDG 11 (pertaining to sustainable cities and communities), and SDG 13 (related to climate action). This study emphasizes the interconnection between gender, age, poverty, and climate vulnerability to strengthen the argument for inclusive climate governance that ensures no one is marginalized.

The research is pertinent to the local community. The Korail Slum, one of the largest informal settlements in Dhaka, exemplifies the challenges faced by millions residing in slums across the nation. The findings from this study could serve as a model for analogous urban environments, supporting community-based initiatives designed to enhance resilience and fortify the capabilities of local governments and organizations in addressing the needs of vulnerable adolescents. This study significantly generates new knowledge, aids in the formulation of practical solutions, promotes social equity, enhances resilience frameworks, and prioritizes the perspectives of a frequently marginalized group. The findings may initiate wider discussions on how to empower the adolescent females residing in urban slums to adapt and thrive in a constantly evolving climate.

In this study, we aim to assess the current situation of urban female teenagers in terms of climate resilience and their knowledge about it. This study will also help us understand how resilient they are currently. This study will highlight, having lived in a large city with support from numerous NGOs and government organizations, the climate change initiatives and the actual changes they have brought about. It will provide valuable insights for future studies, helping create a comparative analysis of climate resilience in other urban areas of Bangladesh.

1.5 Objective

The objectives of the thesis are:

- To assess the level of understanding and awareness of climate change among female adolescents in the Slum of Dhaka.
- To examine the physical, social, and economic resilience capacities of these adolescents in response to climate-induced urban challenges.

1.6 Structure of the Dissertation

Table 1 Structure of the Dissertation

Chapter	Title	Description
Chapter One	Introduction	This chapter introduces the research topic by providing a comprehensive understanding of climate change, urban vulnerability, and gendered resilience in Bangladesh. It establishes the rationale for focusing on adolescent girls in urban slums, outlines the research objectives, and highlights the significance and scope of the study within both local and global contexts. Key concepts, definitions, and the research problem are also articulated to provide a clear foundation for the study.
Chapter Two	Literature Review	This chapter offers a comprehensive examination of the current literature regarding climate change, climate vulnerability, and resilience, with a particular focus on women and adolescent girls residing in urban informal settlements. It combines the results of earlier studies, points out areas where more research is needed, and talks about climate adaptation strategies on a global and regional scale. The chapter also talks about the theoretical frameworks that help us understand how vulnerable and strong the climate is.
Chapter Three	Research Methodology	This chapter details the research design and methodological approach, including the study's qualitative and quantitative components. It explains the research questions, data collection

		instruments (such as surveys, interviews, and focus groups), sampling procedures, and justification for selecting Korail slum as the study site. Ethical considerations, data reliability, and validity measures are also discussed to ensure rigor and credibility of the research.
Chapter Four	Findings and Analysis	This chapter shows the study's results, which look at the climate vulnerability and resilience of teenage girls living in the Korail slum by combining quantitative and qualitative data. It contains statistical analyses, tables, and a thematic examination of significant patterns and trends associated with exposure, adaptive capacity, and socio-economic and gendered factors affecting resilience. Insights from participants' experiences are emphasized to offer a comprehensive understanding of the challenges and coping strategies.
Chapter Five	Discussion	This chapter analyzes the findings in relation to existing literature and theoretical frameworks. It looks at how educational, social, economic, and environmental weaknesses affect the climate resilience of teenage girls. This chapter talks about problems with institutions, mental health issues, community-based ways to adapt, and policy problems. It also gives evidence-based suggestions for making climate adaptation programs better, gender-sensitive interventions, and urban planning strategies that include everyone.s
Chapter Six	Conclusion	The final chapter summarizes the key findings of the study, reflecting on the research objectives and questions. It provides an integrated conclusion about climate vulnerability and resilience of adolescent girls in urban slums. The chapter highlights policy implications, potential interventions, and practical measures to strengthen resilience. Recommendations for future research and long-term strategies to empower adolescent girls in climate adaptation are also outlined.

CHAPTER TWO

Literature review

2.1 Climate Change and Urban Vulnerability in Bangladesh

The Intergovernmental Panel on Climate Change (IPCC) ranks Bangladesh as one of the most susceptible nations to climate change. At the same time, Bangladesh has positioned seventh as the most vulnerable to natural disasters prone country according to Global Climate Risk Index 2021 ranking. Bangladesh is very vulnerable to climate change and natural disasters including heatwaves, flood and so on, later, lack of infrastructure and high population density worsen these effects (Tushar and Parvin.,2024; Saha and Barua.,2023).

However, Ahmed et al. (2019) highlighted that metropolitan regions, including Dhaka, are increasingly facing climate-related issues caused by unregulated urbanization, insufficient infrastructure, and rapid population growth. Similarly, Shahid et al., (2016) concluded that Bangladesh's urban population is sensitive to climate change because of high population density, insufficient infrastructure, and poor population adaptability to changing conditions. The fifth and sixth Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC) suggested that societal vulnerability could increase climate risk. In this context, Korail Slum in Dhaka is a vulnerable informal settlement due to its location on environmentally sensitive land, poor drainage, a lack of potable water, and unstable housing which make Korail Slum exposed to environmental risks.

However, in the lack of governmental protection or dependable infrastructure, many residents living in Korail encounter persistent dangers. A significant number of these individuals are climate migrants who have relocated within the country.

2.2 Understanding Climate Vulnerability

Adger and Brown (2009) define climate change vulnerability using exposure and adaptive capability. The level of climate-related hazard a community faces is called "exposure." The ability to adapt or recover from climate-related disasters is called "adaptive capacity". However, climate change threatens water, food, ecosystems, and energy.

Pielke (2013) stressed the importance of bottom-up analysis to identify local issues before tackling global issues. UN-Habitat (2016) found that slum dwellers face several social, economic, and environmental issues. Haigh et al. (2020) stated that unfair health inequalities enhance vulnerability to climate-related hazards and lower adaptive potential as marginalized individuals are less adaptive. He further added that the importance of health impact studies to adjust interventions to community needs and understanding how people perceive their climate change risk is crucial to successful adaptation efforts.

Nelson et al. (2023) found that individual experiences and environmental worldviews affect coastal community adaptation. These situations may make it hard to stay flexible due to a lack of resources, social assistance, and educational opportunities. They put slum dwellers in a "vulnerability trap," meaning their socioeconomic condition affects their ability to cope with climate shocks, according to Pandey et al. (2018).

2.3 Gendered Dimensions of Climate Vulnerability

Segnon et al. (2024) elucidated that women are more inclined to rely on climate-sensitive livelihoods, rendering them more susceptible to climatic variability. Le Masson et al. (2016) discovered that climate change disproportionately impacts women and girls relative to men, attributable to social, economic, and cultural disparities. Gender roles often impede mobility, decision-making, and resource acquisition. Urban slum teenage girls are especially vulnerable to these problems because of their age and gender. Basiru et al. (2022) and Muia et al. (2024) discovered that families led by women are more susceptible to risks. Climate change has a bigger effect on countries like Bangladesh, which poses serious risks to farming jobs, especially for women. Research shows that climate adaptation strategies often ignore the gendered aspects of vulnerability, which makes inequalities worse and limits women's ability to adapt (Ashrafuzzama et al., 2022).

Research indicates that structural constraints and social norms within agricultural and rural contexts exacerbate women's vulnerability to climate impacts, encompassing extreme weather events and prolonged environmental changes. To build resilience and adapt to climate change, we must address gender inequalities and give women more power through policies and practices that include everyone. This will help support sustainable agri-food systems and reduce climate risks (Phan et al., 2019). Climate change significantly influences population migration and gender-

specific vulnerabilities; however, the interaction between these factors remains insufficiently explored beyond binary gender analyses. Research shows that women in less developed countries are especially vulnerable because of differences in how they manage resources, their bodies, and their social lives. This is why climate adaptation strategies need to take gender into account. A study conducted in a coastal Vietnamese village illustrates that gender norms dictate labor distribution and access to social networks, thereby influencing women's ability to adapt to climate change. In South Africa, high temperatures make it harder for low-skilled women to work, especially in industries where they are exposed to a lot of heat. This shows how important it is to have specific adaptation programs to help with these problems.

Because women have fewer resources and support networks. Adeola et al. (2024) and Daoud (2021) found that gender norms made it harder for women to obtain land, water, and technology which also make them more vulnerable. Khan et al. (2021) list early marriage, sexual assault, domestic employment, and dropping out of school after graduating as major difficulties. These are major resilience inhibitors. Research in South Asia (UNICEF, 2016) found that during environmental emergencies, girls are more likely to be expelled from school and have less access to health services and climate change information. This is because climate change makes females more susceptible. Due to their gender-specific vulnerabilities, women find it harder to adapt to and recover from climate-induced disasters. Women are more vulnerable to climate change than men due to their socially defined roles and duties in both domestic and communal settings (UNFCCC, 2019a; IUCN, 2015). In emerging nations, women constitute an essential labor force in the rural economy. As climatic threats intensify, women are compelled to assume a greater domestic workload due to the outward migration of men.

Furthermore, rural women experience greater marginalisation in political and domestic decision-making that impacts their lives, as they frequently confront patriarchal cultural norms and detrimental stereotypes that hinder their ability to address the effects of climate change (Figueiredo and Perkins, 2013; Boetto and McKinnon, 2013; IUCN, 2015; UNDP, 2013). Over the past decade, the exacerbation of gender inequalities due to climate change has been consistently highlighted (Denton, 2010; Djoudi et al., 2016; IUCN, 2015; UNDP, 2013). This issue necessitates intervention at local, national, and global levels to address the under-representation of women in decision-making roles, hence improving their support systems and resilience.

2.4 Adolescents and Climate Change

Despite comprising a significant portion of metropolitan populations, teenagers are predominantly excluded from the planning process for climate adaptation initiatives. Climate-related disturbances can adversely impact an individual's physical health, mental well-being, and educational achievements (Boyden et al., 2019). Adolescence is a critical developmental phase that climate-related disturbances can influence. Vergunst et al., (2024) assessed that the adolescents show increased symptoms of anxiety, depression, and self-harm associated with climate change worry. The studies by Hao et al., (2024) revealed that younger adolescents and those from lower socio-economic backgrounds are particularly vulnerable to mental health deterioration due to climate-related stressors.

Accordingly, Drumm & Vandermause, (2023) found that the lived experiences of adolescents highlight a continuum of concern, indicating that climate change is perceived as a temporal threat that pressures their mental well-being. Adolescent females, especially those residing in slums, often possess minimal power within their families or communities. They are rarely engaged in decision-making or disaster preparedness planning. Research indicates that adolescent girls can serve as effective agents of resilience and risk communication within their communities when afforded education and community support (Plan International, 2015).

2.5 Climate Resilience: A Multi-Dimensional Concept

Turner et al. (2003) assert that the capacity to learn from, adapt to, and alter in response to adversity is a fundamental aspect of resilience. Resilience is not simply the ability to endure unfavorable circumstances. Access to education, healthcare, emotional support, social networks, and economic opportunities constitute the resilience of adolescent girls.

However, in the contexts such as Korail, where community-based coping strategies may replace the formal governmental assistance (Ahmed et al., 2019), social resilience emerges as a critical feature. In this regard, resilience is defined by Motevalli et al., (2023) as the ability to adapt successfully to adverse conditions, including climate change impacts. Key components include exposure, susceptibility, and coping capacity, which are influenced by psychological, social, and community factors. Ren et al., (2017) focused on the multi-dimensional resilience triangle model that illustrates the interplay between survival probability, reactive timeliness, and cost management in engineered systems. The Socio-Ecological Resilience Framework, established by

Bronfenbrenner in 1979, is particularly pertinent here as it recognizes that resilience is shaped by multiple levels, encompassing individual, interpersonal, community, and institutional ties. An illustration of this is a girl who, while cognizant of the perils associated with climate change, finds her capacity to act constrained by familial expectations, societal standards, and the accessibility of infrastructure.

2.6. Climate change and Urbanization

Bangladesh is highly susceptible to the effects of climate change due to its geographical position, elevated population density, significant poverty levels, and the dependence of numerous livelihoods on climate-sensitive sectors, especially urban sectors (Roy et al., 2010). Khan (2010) asserts that the urban poor are more susceptible to the effects of climate change, with the impact being even more pronounced in Dhaka city. The slum inhabitants are crucial to Dhaka's economy, as they sustain it through their labour and supply essential services to urban residents. Consequently, it is imperative to enhance comprehension of the true dynamics of climate change affecting the urban poor and their livelihoods, particularly in Dhaka, which houses the largest population of urban impoverished individuals.

2.7. Informal Settlements and the Challenge of Resilience

Despite their vulnerability, unofficial communities like Korail are flexible and imaginative. Local officials build higher dwellings; form neighborhood watch clubs and create informal drainage systems. These efforts are usually insufficient because local officials ignore them and do not include them in development plans (UN-Habitat, 2016). In these regions, women suffer safety problems, pressure to marry early, and movement restrictions.

Winter et al. (2025) found that informal settlement women are resilient while being more vulnerable. Their adaptability and resource bargaining tactics show that resilience requires better institutional support and equitable resource access. According to Khan et al. (2021), these traits make people less disaster-resistant, and it is harder to access vital information and early warning systems.

2.8. Climate Knowledge and Awareness among Youth

Climate resilience requires several key elements, such as awareness and education. Shepherd et al. (2019) found that slum adolescents often lack knowledge of climate change, its causes, and

possible remedies. However, women's knowledge gap is notably large due to unequal educational chances and gendered norms that limit their mobility to domestic life. Siddique et al. (2024) discovered that young Bangladeshis had a mean climate change knowledge score of 7.10 out of 13.

This showed that Bangladeshi youth comprehend climate change moderately. Ghanekar et al. (2014) found that urban slum teenagers recognized climate change-related health factors. These variables, including water shortages and poverty, demonstrated that teens understood the interconnectedness of various problems. Climate change education in formal and non-formal educational institutions can dramatically boost adaptation capacity. Jaro'ah et al. (2023) found that young people get climate knowledge from peers, TV, and social media. This discovery underscores the significance of online platforms in disseminating information. According to Plan International (2015), giving adolescent girls the right information can help them to participate in household decision-making, mobilise their peers, and prevent climate-related threats.

2.9. Intersectionality and Climate Justice

The intersectionality hypothesis, proposed by Kaijser and Kronsell (2014), is used in climate research to understand how intersecting identities like gender, age, socioeconomic status, and location create unique vulnerabilities and resilience. De Jong (2024) found that climate change worsens pre-existing inequality by disproportionately affecting disadvantaged groups based on their age, gender, and race. In slums like Korail, young women are marginalized in various ways. Disregarding these intersections results in adaptation methods that are relevant to many situations but ignore the needs of at-risk individuals.

Justice-centered strategies recognize that resilience cannot be built without first addressing inequalities that limit resources and rights. Thus, it is essential to allow girls to voice their needs and participate in community and local government planning. Andra Costache (2023) found that this synergy enhances a holistic understanding of climate change's effects and emphasizes the need for equitable solutions that account for vulnerability's complexity.

2.10 Youth Agency and Participation in Climate Adaptation

Recent study suggests that young people can influence climate change and build resilience. Checkley et al. (2021) found that teenagers can act as knowledge brokers in their families and

communities, turning climate information into household activities. Bartlett (2008) notes that urban disadvantaged youth are rarely included in climate planning or policy frameworks. Ojala (2016) found that youth environmental action reduces climate fear and gives them agency. Rahman et al. (2022) revealed that Bangladeshi youth-led climate initiatives mobilized communities for storm preparedness and trash management. Teens need information, organizational spaces, and policy engagement to become resilient.

2.11 Psychological Dimensions of Climate Vulnerability

Climate change's psychological effects on adolescents are becoming more apparent. These repercussions contribute to climate change's physical and social risks. Hickman and colleagues (2021) found that young people worldwide have climate fear. These people suffer from worry, powerlessness, rage, and melancholy, which harms them. This worry is reinforced by structural inequities, lack of opportunities, and daily survival challenges for female adolescents in urban informal settlements. Clayton (2020) states that climate-related mental health expenses worsen societal stresses like poverty, violence, and gender discrimination. Jones and Davison (2021) say climate-induced trauma can affect education and social development for years. This emerging field of climate psychology highlights the importance of including mental health treatment in climate adaptation efforts, especially for vulnerable groups like urban slum girls.

2.12 Technology, Information Access, and Digital Divide

Another important area of research is how technology and digital inclusion can help us deal with climate change. Aker and Mbiti (2010) say that mobile phones have changed how low-income people get climate information, early warnings, and networks for sharing resources. Hasan et al. (2021) discovered that households in Dhaka's slums are progressively utilizing mobile-based weather notifications, notwithstanding gender-specific phone ownership limitations that hinder access for adolescent girls. This "digital divide" makes it less likely that girls will get timely warnings and be able to take part in internet awareness campaigns, which makes them more vulnerable to climate change. Olorunfemi and Raheem (2013) say that digital literacy can help young people become more resilient. It gives young people the power to speak up, plan community projects, and make sure that local governments are doing their jobs. So, using ICT technologies in educational and youth programs may help cities that don't have enough resources become more aware of and ready for climate change.

2.13 Policy and Institutional Gaps in Climate Resilience

Institutional responses are commonly stressed in vulnerability and resilience research. Tanner and Mitchell (2008) found that most climate plans in poor nations ignore adolescent and gender problems, leaving them invisible in adaptation planning. Ahmed et al. (2020) argue that urban slum residents are marginalized due to municipal government systems' failure to recognize informal settlements. Institutional neglect leaves Korail with poor infrastructure, unsafe housing, and weak disaster response. Alam and Collins (2010) also note that fragmented governance across government agencies and NGOs leads to program repetition and inadequate long-term resilience outcomes. Community-based adaptation has met local needs in South Asia, however Huq and Ayers (2008) found that lack of funding and policy integration limit its impact. Institutional invisibility makes informal settlement female adolescents more vulnerable and limits their input into adaptive measures.

2.14 Climate-Induced Migration and Social Disruption

Immigration, together with climate-induced movement, makes cities vulnerable. Black et al. (2011) believe that migration is both a way to cope with hardship and a source of new vulnerabilities because migrants often move to informal settlements with low infrastructure and social protection. Etzold et al. (2014) found that rural-to-urban climate migrants, many of whom are adolescents, have insecure livelihoods, unstable housing, and isolation from city services in Dhaka. Female adolescents are more likely to marry as youngsters and have less access to medical care when migrants disrupt their education (Islam and Hasan, 2016). Female adolescents are more vulnerable. Without male family members who relocate for work, girls may undertake more housework. This is another way migration changes families. These dynamics bolster the notion that migration, climate change, and gendered vulnerabilities are interconnected and require more nuanced research on urban slum youth.

2.15 Social Capital and Community Networks in Resilience

The research concludes that social capital, networks, trust, and collaborative action, improve resilience. Putnam (2000) found that strong social ties help communities mobilize during crises. Social capital often compensates for official support in informal settlements because communities pool resources for drainage, home repairs, and informal disaster response, according to Moser and

Satterthwaite (2010). However, gender norms that limit mobility and social contact limit adolescent female participation in such networks (Chant, 2013). However, research in India (Joshi et al., 2015) and Kenya (Mohammed et al., 2022) shows that girls' resilience increases when they join youth clubs and community organizations. Peer support, leadership training, and collective lobbying achieve this. Recognizing and improving social capital in slums like Korail can enable the inclusion of adolescent girls in community-based resilience initiatives.

2.10. Research Gap

While climate change adaptation and resilience have become pressing global research priorities, existing scholarships tend to emphasize broad community-level strategies, adult women's vulnerability, or household adaptation mechanisms in poor urban contexts. However, there remains a significant blind spot concerning female adolescents living in informal urban settlements, who face unique risks, vulnerabilities, and constraints shaped by both their age and gender. Most available studies approach climate resilience in urban slums from an infrastructural, livelihood, or health perspective, often overlooking how climate vulnerability intersects with the social, cultural, and developmental dimensions of adolescent girls' lives.

For instance, issues such as restricted mobility, lack of access to decision-making spaces, limited awareness of climate risks, and reliance on informal coping strategies remain underexplored in academic discourse. Moreover, adolescent girls often experience compounded vulnerabilities due to gender norms, educational disadvantages, and economic dependency, yet they are rarely included as active agents in resilience-building frameworks. Additionally, regional scholarship in South Asia disproportionately focuses on rural climate impacts, disaster-prone coastal areas, or general urban populations, with insufficient attention to the lived experiences of adolescents in megacity slums like Dhaka. Context-specific analyses of climate awareness, resilience capacities, and adaptive practices among female adolescents in urban slum environments are scarce, even though these communities are at the frontline of climate-induced stresses such as flooding, heat waves, and water scarcity. This gap highlights significant research need: to integrate the voices and experiences of female adolescents into urban climate resilience discourse, thereby informing inclusive policies and interventions. By addressing this overlooked demographic, the study contributes not only to the understanding of vulnerability but also to the potential of nurturing resilience in a formative stage of life, which can have long-term societal benefits.

2.11. Conceptual Framework

A conceptual framework has been developed that incorporates climate vulnerability, resilience, and gendered risk theories. These theories are crucial to explain urban slum teenagers' climate sensitivity. This framework demonstrates how socio-demographic factors and institutional support affect female adolescents' knowledge, preparedness, and resilience to climate-induced threats including fire and heat. Using the Intergovernmental Panel on Climate Change's vulnerability model, vulnerability of female teens is assessed according to exposure, sensitivity, and adaptability. Direct experiences with intense heat or fire incidents are considered "exposure" in this context. Age, living situations, and health might alter sensitivity. Education, knowledge, institutional support, and availability to vital resources affect a person's ability to adapt. This study examines how people cope with climate change from the aspects of Vulnerability, exposure, sensitivity, and adaptation.

This framework also uses the resilience principle which incorporates defines resilience as the ability of individuals or systems to tolerate disturbance, adapt to change, and evolve in response to detrimental impacts (Walker et al., 2004). In this study, resilience is operationalized by considering fire safety, clean water, awareness initiatives, and emotional and psychological well-being by measuring climate change's adaptive capability and susceptibility, resilience assessment is used.

Gendered Vulnerability Theory emphasizes that women and girls, especially in low-income contexts, are disproportionately endangered by climate change due to structural inequities, socio-cultural norms, and limited access to resources (Enarson, 2000; Arora-Jonsson, 2011). In this sense, this framework is appropriate to assess the vulnerability and resilience of female adolescent as they are marginalized both by age and gender and are often overlooked in disaster policy planning.

The conceptual framework demonstrates that understanding vulnerability and disaster preparedness of female adolescents is shaped by the education level, instructional support, and prior training program. It is anticipated that adolescent girls with higher education, institutional support, and initial training will demonstrate enhanced comprehension of climate change and preparedness for disasters. Individuals with poor household income, limited education, and insufficient support systems exhibit diminished resilience and heightened vulnerability.

Psychological aspects, including psychological preparedness, perceived threat, and trust in institutions, function as mediators in these relationships.

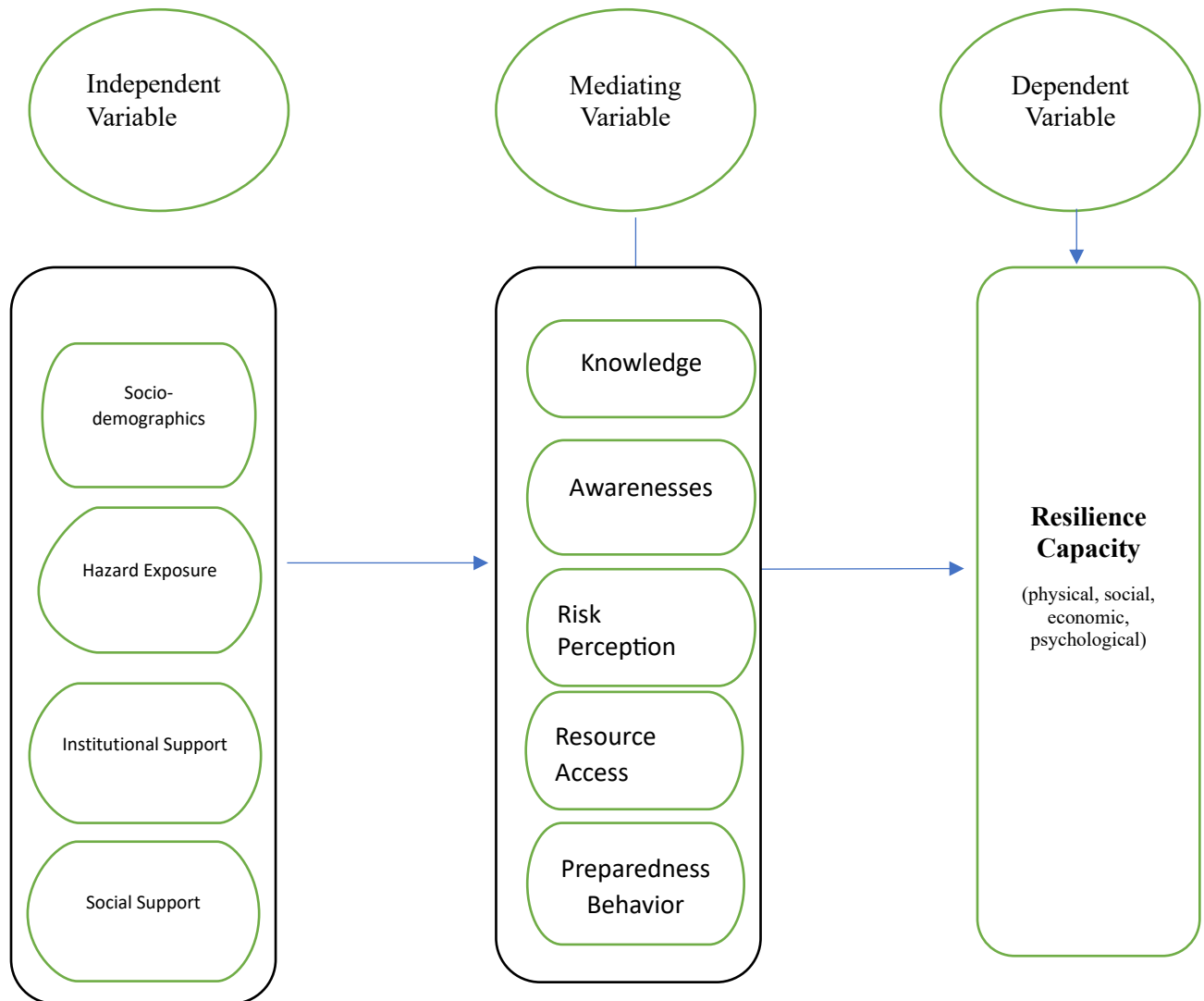


Figure 1 Conceptual Framework

CHAPTER THREE

Methodology

3.1. Research Approach

The methodology employed in this study is a mixed-methods approach, integrating both qualitative and quantitative research techniques. Creswell and Plano Clark (2018) assert that a mixed-methods approach can yield a more comprehensive understanding of the vulnerabilities and resilience capacity of adolescent females residing in slums. This is achieved by integrating statistical patterns with the participants' experiences. A structured questionnaire was administered to adolescent females as a component of the study's quantitative analysis. Conversely, qualitative insights were obtained through Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs).

3.2. Research design

This study utilized exploration and descriptive research methodologies. The exploratory component offers an in-depth comprehension of the social, emotional, and institutional dynamics that form resilience, while the descriptive approach facilitates the documentation of the frequency of climate-related effects, including fire occurrences and heatwaves, affecting adolescent girls. This approach is an exceptional choice for under-explored situations such as urban slums, where systematic data is frequently scarce (Babbie, 2020).

3.3. Study population and area

The study was conducted in Korail Slum, a prominent informal neighborhood in Dhaka. This slum is characterized by high population density, fragile infrastructure, and frequent exposure to environmental hazards. The study's target demographic consisted of female adolescents aged 13 to 19 residing in the slum. These teenagers, owing to their age, gender, socioeconomic status, and restricted access to resources, constitute one of the most susceptible demographic groups affected by the demands of climate change.

3.4. Sampling technique and size

The research utilized a purposive sample method, a form of non-probability sampling, to choose individuals from the Korail slum in Dhaka. This strategy was deliberately selected to concentrate on female teenagers aged 13–19, regarded as one of the most climate-vulnerable population groups

due to their age, gender, and socio-economic condition. Purposive sampling is particularly suitable for research that seeks to investigate certain features, experiences, or perceptions in detail (Etikan, Musa, & Alkassim, 2016).

Respondents for the quantitative survey were chosen according to the specified inclusion criteria, including dwellers of Korail Slum, being a female adolescent aged 13 to 19 years, and being accessible and prepared to engage in an in-person interview. Besides that, purposive sampling was conducted to select respondents for the FGDs who female adolescents of the slum are and KIIs who possess pertinent skills (NGO personnel, educators, healthcare professionals, community leaders)

Table 2 Respondents of the study.

SI No	Number of respondents	Types of respondents	Data collection method	sampling
1	120	Female adolescents	Questionnaire survey	Purposive sampling
2	5	NGO officials, govt officials, and CBO leaders and healthcare officials.	KII	Purposive sampling
3	6	Female adolescents	FGD	Purposive sampling

3.5. Data Collection method and tools

Both primary and secondary data collection techniques were followed to conduct this research.

3.5.1. Primary Data Collection

3.5.1.1. Questionnaire survey:

A structured questionnaire survey has been conducted to collect quantitative data on climate vulnerability and resilience among the adolescents of the slum in Dhaka. Questionnaires provide a standardized way to gather data from many participants, enabling statistical analysis (Bryman, 2016).

3.5.1.2.Focus Group Discussions (FGD):

FGD has been conducted to get an in-depth understanding of the climate vulnerability and resilience among the female adolescents of slums in Dhaka City. FGDs involve small groups of community members discussing their perceptions and experiences on climate vulnerability and resilience. It allows the researcher to explore collective experiences and attitudes, capturing the social dimensions of climate vulnerability and resilience (Krueger & Casey, 2015).

3.5.1.3.Key Informant Interviews (KII):

Interviews with the NGO officials, community leaders, healthcare officials and local government officials provide insights into climate vulnerability and resilience. KIIs are essential for exploring detailed, expert perspectives that cannot be obtained through group discussions (Patton, 2002).

Table 3 Data collection method of study

Data Collection Method	Instrument
Questionnaire survey	Structured questionnaire
KII	Interview Protocol and recorder
FGD	Interview Protocol and recorder

3.5.2. Secondary Data Collection

Desk Review: This study analyzed the existing different government and NGO reports on climate vulnerability reports, government policies, and academic literature on climate vulnerability and resilience. Secondary data provides the context and helps to identify gaps between policy and practice (Bowen, 2009).

3.6. Data Analysis

In this study, the data were collected from both primary and secondary sources. Regarding primary sources, quantitative data were collected from female adolescents using a structured questionnaire. On the contrary, FGD and KII were used to collect qualitative information from different stakeholders. The collected data was organized chronologically, providing appropriate code for the correct variable, which were inserted, cleaned, and tabulated. The Statistical Package

for Social Science (SPSS) 26 have been used to analyse the quantitative data. Descriptive and inferential analyses have conducted for the quantitative data.

At last, 7 version have been used for analysing the qualitative data. Thematic analysis for primary qualitative data and the document analysis technique has been followed for secondary qualitative data.

This study has been triangulated by the different methods in data collection.

Table 4 Data triangulation

No	Areas of triangulation	Ways
1	By study	Relevant articles, journals, government and NGO reports.
2	By data Source	Primary Data
3	By method	Questionnaire survey, KII, and FGD

3.7. Ethical Consideration

The study followed all the ethical guidelines to conduct a study. Consent has been obtained from each respondent individually. The data were used anonymously for the study. All participants were briefed on the study purpose and their voluntary participation. The data were anonymized to protect the participants' privacy, confidentiality, and anonymity if any. The study avoided causing harm to participants and adhere to ethical guidelines for research (APA, 2020). Freedom of withdrawal from the study at any time without assigning any reason.

3.8 Logical Framework

Table 5 Logical Framework

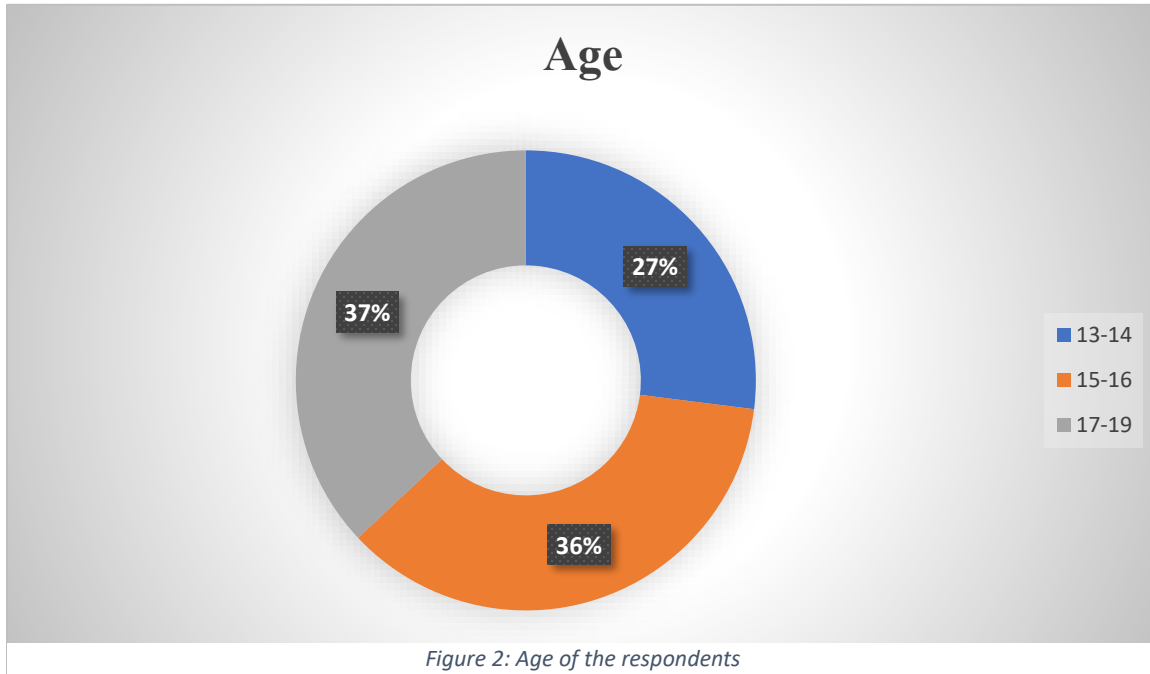
S.N.	Objective	Measurable Indicators	Sources of Information	Data Analysis Method
1	To assess the level of understanding and awareness of	- Percentage of respondents aware of climate change concepts	Structured questionnaire	Descriptive statistics (mean, frequency,

	climate change among female adolescents in Korail Slum	- Knowledge score on climate hazards, causes, and impacts - Awareness of coping and adaptation strategies	administered to 120 female adolescents	percentage) and inferential analysis using SPSS 26
2	To examine the physical, social, and economic resilience capacities of adolescent girls	- Number of respondents reporting coping strategies during fire or heatwave - Access to safe spaces, health services, and disaster training - Participation in community support networks	Structured questionnaire (quantitative), FGDs with 6 adolescent girls, KIIs with 5 stakeholders (NGO officials, educators, healthcare, community leaders)	Thematic analysis for qualitative data; descriptive and inferential statistics for quantitative data
3	To explore institutional perspectives on adolescent girls' climate vulnerability and resilience	- Existing programs, policies, and interventions for climate resilience - Institutional challenges and recommendations - Perceived role of adolescents in climate adaptation initiatives	Key Informant Interviews (NGO officials, government personnel, community leaders, healthcare staff)	Thematic analysis for qualitative insights; document review of policies and reports
4	To identify gender-specific vulnerabilities in urban slum contexts	- Incidence of harassment, restricted mobility, and health issues during disasters - Differences in awareness and participation by age or socioeconomic status	FGDs with adolescent girls; structured questionnaire; KIIs	Thematic analysis for qualitative data; cross-tabulation and frequency analysis for

				quantitative data using SPSS
5	To triangulate findings for reliability and validity of results	- Consistency of findings across multiple methods (survey, FGD, KII) - Alignment with secondary sources such as government/NGO reports	Primary data (survey, FGD, KII) and secondary data (policy documents, academic literature, NGO reports)	Data triangulation comparing quantitative, qualitative, and secondary data; thematic and content analysis

4.1 Quantitative data analysis

4.1.1 Age of the Respondents



The pie chart presents the age-wise distribution of female adolescent respondents from Dhaka's Korail slum, segmented into three distinct groups. The 13–14 years age group accounts for 27% of the total respondents, representing a significant portion of younger adolescents who are typically in the early stages of their teenage years. The 15–16 years category includes 36% of the participants, making it the largest group in the study. This age group falls in the middle phase of adolescence, often marked by increased independence and social interaction. The 17–19 years group comprises 37% of the respondents, indicating that a substantial proportion of participants are older adolescents approaching adulthood.

4.1.2 Educational Attainment of the respondents

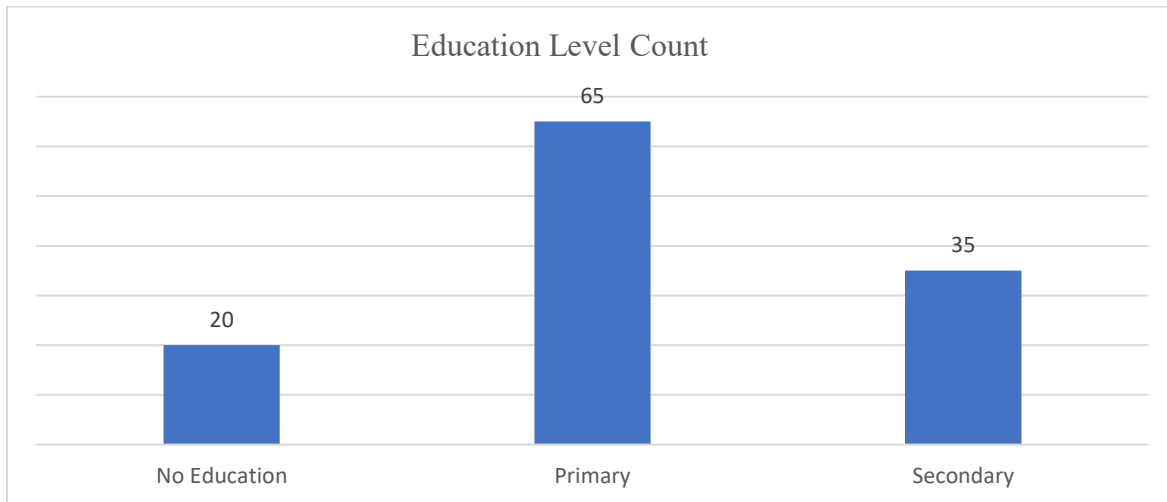


Figure 3: Educational Status of Respondents

The bar chart shows that out of total individuals, 65 (or 54.2%) have attained primary education, making it the most common level of education. Secondary education is the next most prevalent, with 35 individuals, accounting for 29.2% of the total. Meanwhile, 20 individuals, or 16.6%, have no formal education. This distribution highlights that while a majority have access to basic education, a significant portion of the population either drops out after primary level or has no education at all, indicating a need for improved educational retention and outreach.

4.1.3 School Attendance Status

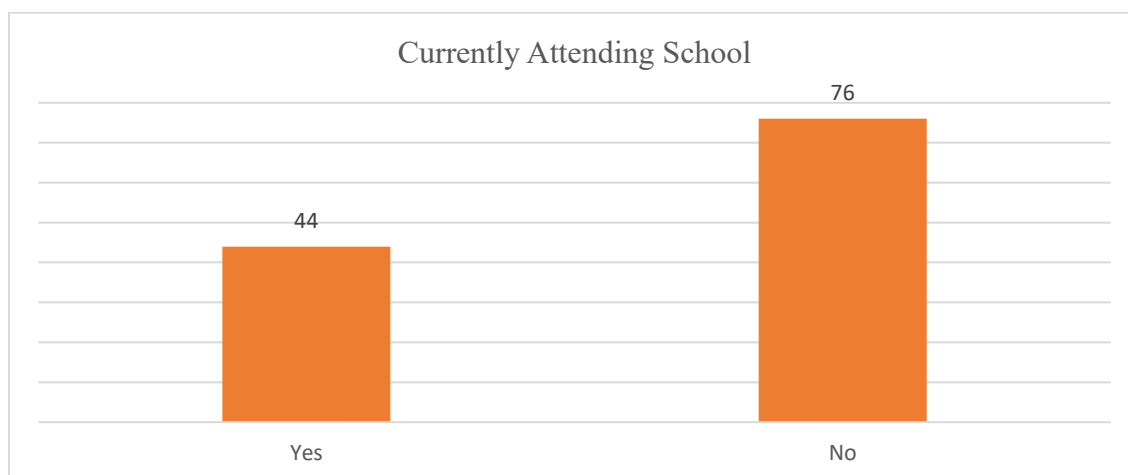


Figure 4: Currently Attending School

The bar chart reveals that 45 (or 37.5%) respondents are currently attending school, while 75 individuals (or 62.5%) are not attending school. This indicates that a significant majority of the population surveyed are out of the formal education system, pointing to potential issues such as school dropouts, age-related non-enrollment, or limited access to ongoing education. Therefore, data underscores the need for targeted interventions to improve school retention and re-enrollment.

4.1.4 Current Occupation



Figure 5: Respondents' Occupation Profile

The bar chart presents the distribution of total individuals across four occupational categories. The highest proportion is Garment Workers, with 41 individuals (or 34.2%), closely followed by those categorized as Others, comprising 40 individuals (or 33.3%). Students make up 23 individuals (or 19.2%), while Domestic Workers represent the smallest group, with 16 individuals (or 13.3%). This data suggests a dominant presence of labor-intensive work, particularly in the garment sector, with a relatively smaller segment still engaged in education.

4.1.5 Household Monthly Income

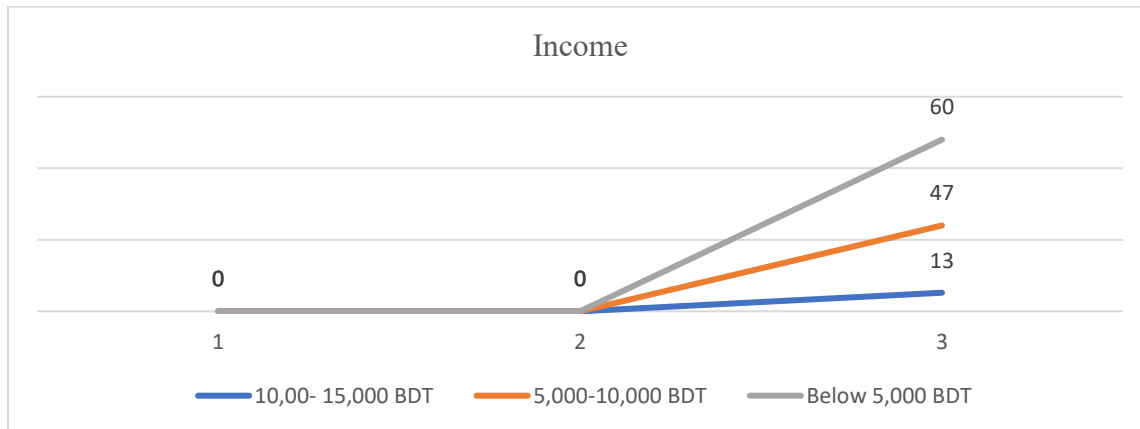


Figure 6: Monthly Household Income

From the chart, it is evident that the majority fall under the "Below 5,000 BDT" income group, which accounts for 120 individuals, representing 60% of the total population. The "5,000–10,000 BDT" group comprises 60 individuals, making up 30%. Meanwhile, the "10,000–15,000 BDT" group includes 20 individuals, which is 10% of the total. This distribution highlights a significant income disparity, with a large portion of individuals earning below the poverty threshold.

4.1.6 Type of Housing

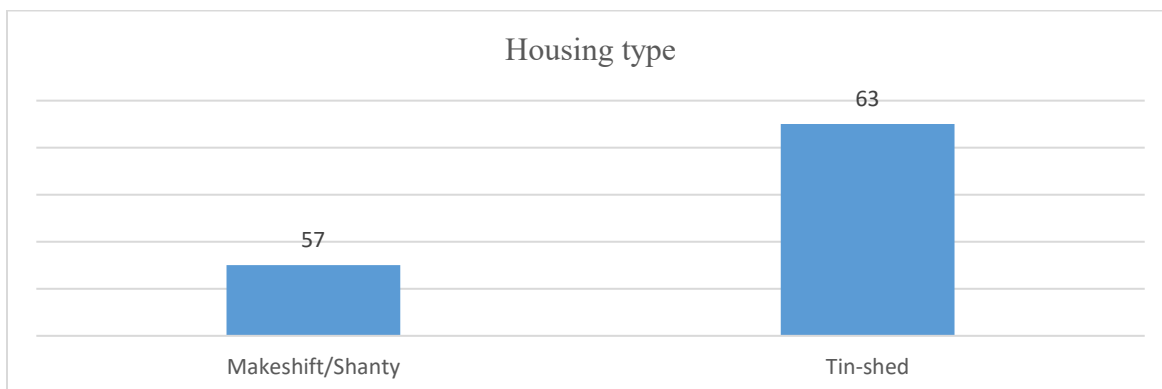


Figure 7: Type of Housing

The bar chart illustrates the distribution of housing types among respondents, specifically between "Makeshift/Shanty" and "Tin-shed" dwellings. Among them, 57 individuals (47.5%) live in Makeshift/Shanty houses, while 63 individuals (52.5%) reside in Tin-shed structures. It indicates a slightly higher preference for the availability of tin-shed housing among the respondents.

4.1.7 Length of Residency in Korail Slum

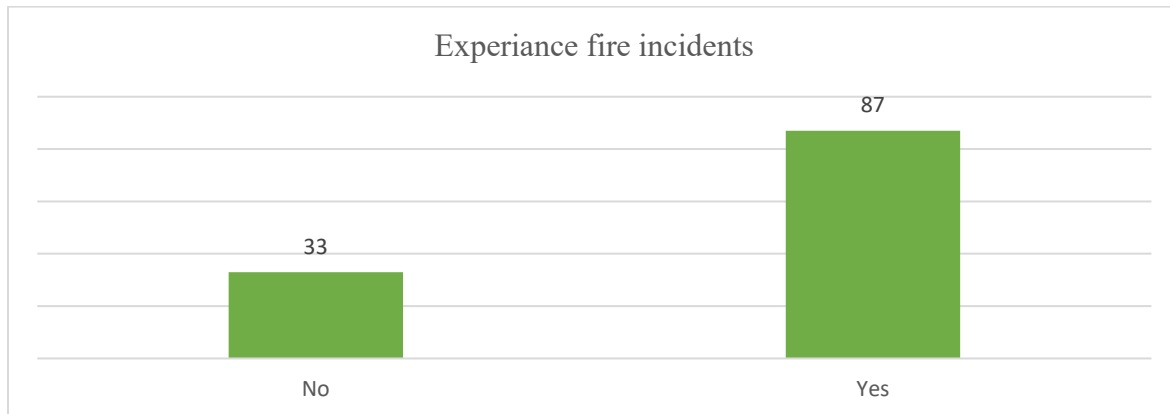


Figure 8: Experienced fire incidents

The bar chart illustrates that a significant majority, 87 respondents (72.5%), reported that they had experienced fire incidents, while only 33 respondents (27.5%) stated that they had not experienced such events. This highlights a critical concern regarding fire safety, as nearly three-fourths of the population surveyed have encountered fire hazards.

4.1.8 Frequency of Fire Incidents

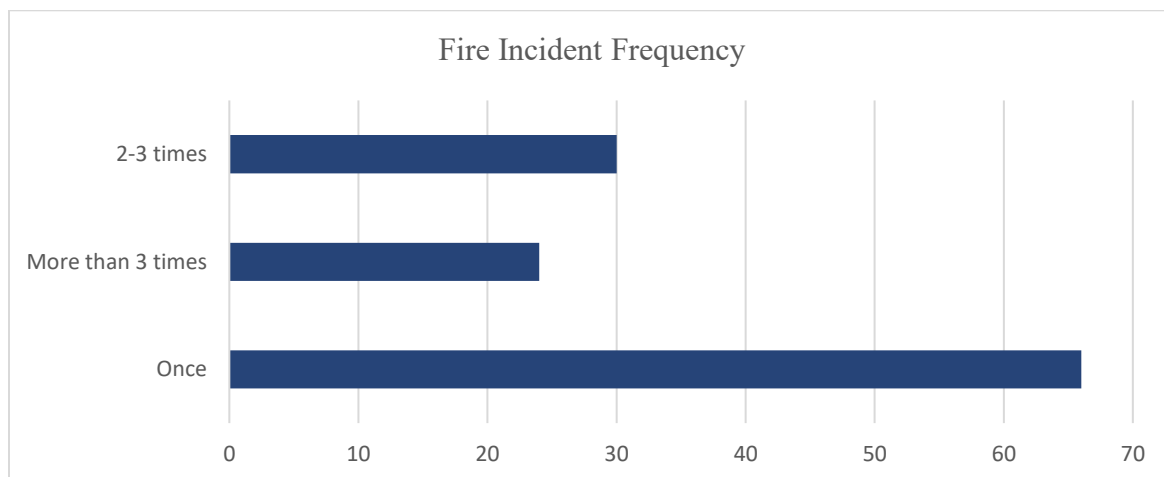


Figure 9: Fire Incident Frequency

The chart illustrates the frequency of fire incidents experienced by respondents residing in Dhaka's Korail Slum. Among the participants who reported encountering a fire-related event, the majority, 66 respondents (55%), indicated that they had experienced a fire incident once in the past three years. This suggests that single-incident exposure is the most common pattern of experience. Meanwhile, 30 respondents (25%) reported facing fire incidents 2–3 times, which indicates a

recurring but moderate level of exposure. Additionally, 24 respondents (20%) experienced fire more than three times, highlighting a smaller yet critically vulnerable subset of the population that faces chronic risk.

4.1.9 Experience with Heat Stress

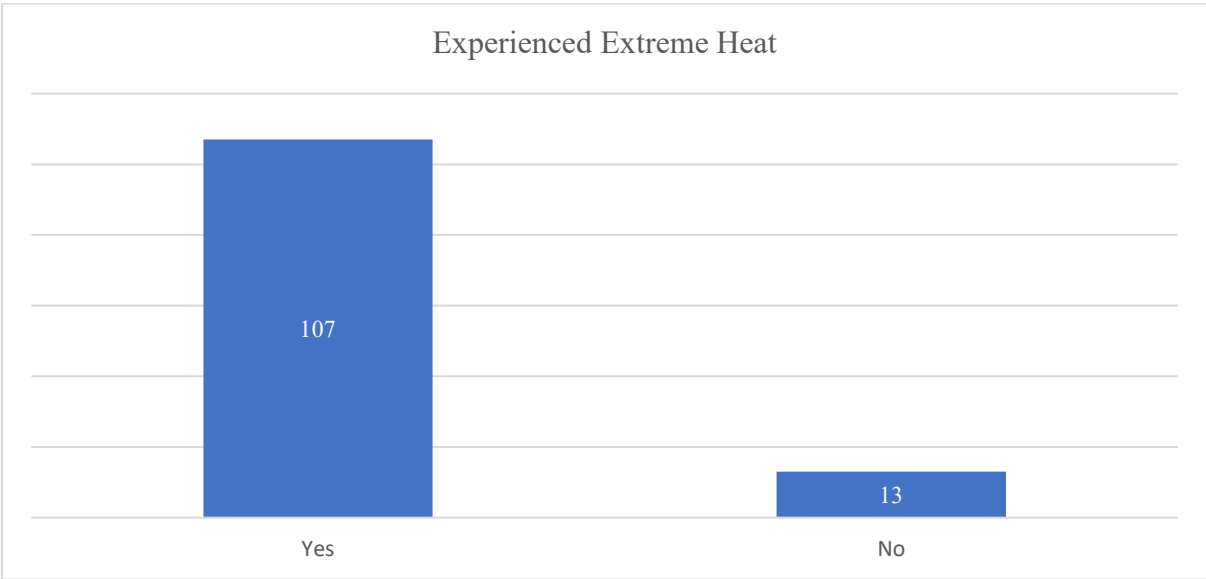


Figure 10: Experienced Extreme Heat

The bar chart demonstrates the proportion of respondents who reported experiencing extreme heat in recent years within the Korail Slum of Dhaka. A significant majority, 108 out of 120 respondents (90%), affirmed that they had felt extreme heat or discomfort during the summer months. In contrast, only 12 respondents (10%) reported not having experienced such conditions. This overwhelming prevalence of heat exposure underscores the intensifying effects of climate change in urban slum settings, where poor ventilation, high-density housing, and limited access to cooling infrastructure exacerbate thermal discomfort.

4.1.10 Climate Change Awareness

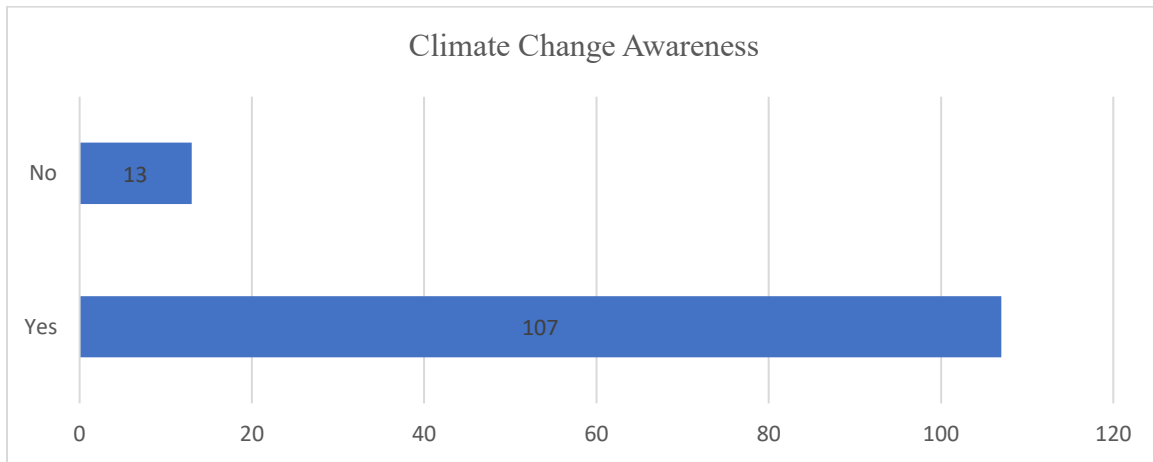


Figure 11: Climate Change Awareness

Based on the responses of female adolescents who live in the Korail Slum in Dhaka, the bar chart provides information regarding the level of general awareness regarding climate change among these individuals. A significant majority of respondents, 105 in total, claimed that they were aware of climate change. This represents 87.5% of the total. On the other hand, fifteen of the respondents, or 12.5%, confirmed that they were not familiar with either the name or the notion.

4.1.11 Source of Knowledge

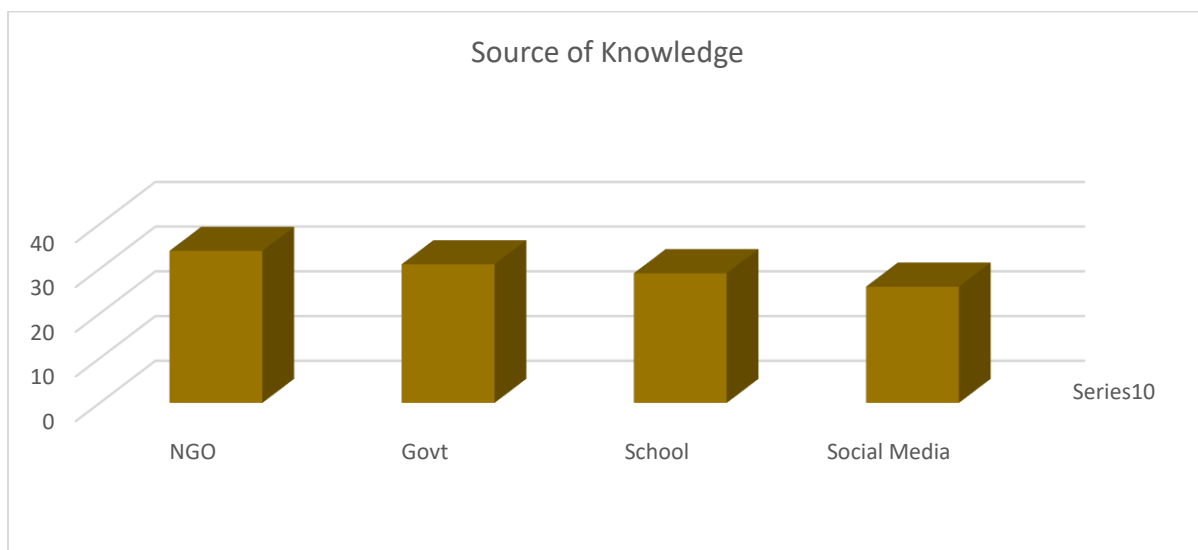


Figure 12: Source of Knowledge

This bar chart shows the respondents' primary sources for climate change information. Non-governmental organizations (NGOs) were identified most by 120 adolescent females in Dhaka's Korail Slum. About 38% of survey respondents said they were their main sources of information followed by government activities (36 respondents) and school attendance (34 respondents). A surprising discovery was that social media platforms were also major information providers.

4.1.12 Attended Climate Training

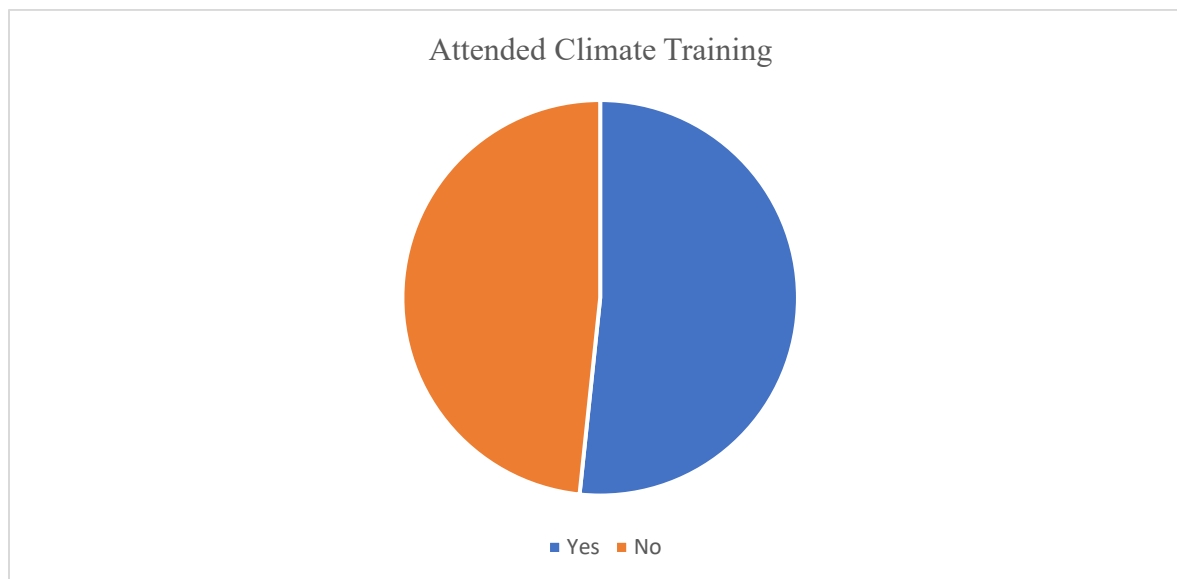


Figure 13: Attended Climate Training

This pie chart shows how many teenage females in Dhaka's Korail Slum participate in climate-related training programs. A little over 53% of survey respondents reported attending climate training. However, significantly less than 47% of participants said they had never participated in such a program. This virtually equal split shows the progress made and the gaps that remain in climate education and readiness for adolescent girls.

4.1.13 Training Provider

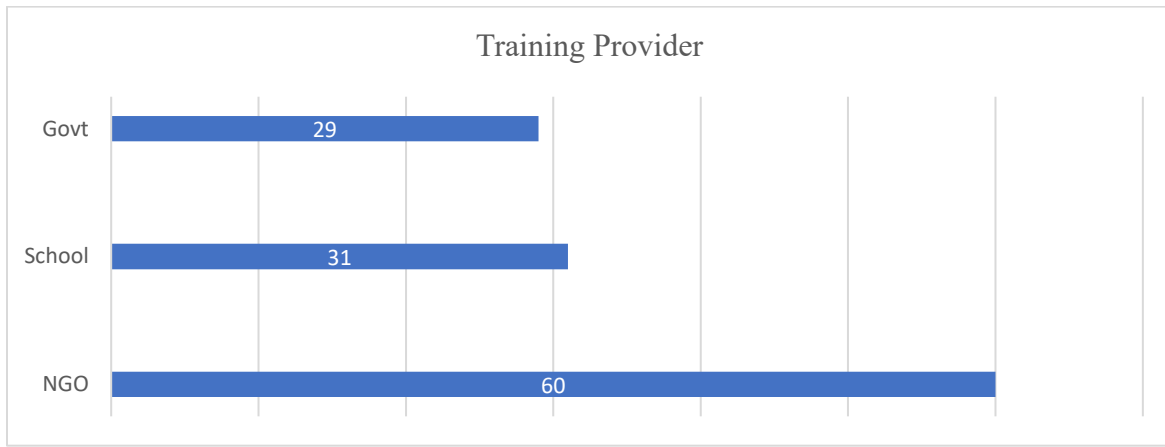


Figure 14: Training Provider

The bar chart illustrates the primary sources through which adolescent girls in Dhaka's Korail Slum have received training related to climate change awareness and disaster preparedness. Among the respondents who attended such programs, the majority, 60 individuals, reported that Non-Governmental Organizations (NGOs) were the main facilitators of their training. This emphasizes the dominant role of civil society organizations in bridging climate education gaps in underserved urban areas. Schools followed as the second most reported source of training, with 32 participants indicating that they received awareness sessions or structured lessons on climate change as part of their academic environment.

4.1.14 Believing that Girls Have a Role

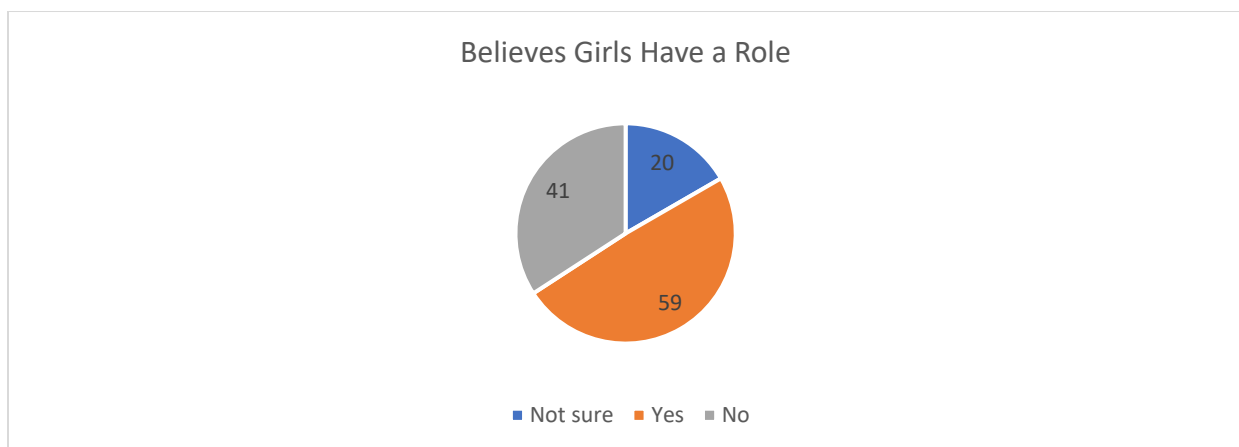


Figure 15: Believing that Girls Have a Role

The pie chart explores the perceptions of adolescent girls in Dhaka’s Korail Slum regarding their involvement in building climate resilience within their community. The responses reflect a diverse range of views among the 120 participants. A significant proportion, approximately 50% of respondents, expressed a positive belief that girls do have a vital role to play in enhancing community resilience to climate change. This suggests that half of the sample recognizes female adolescents as potential contributors to climate action, despite their vulnerable socio-economic status. However, the chart also reveals that approximately 35% of the respondents disagreed, stating that girls do not have such a role. This perspective may be rooted in prevailing gender norms, limited access to resources, or lack of empowerment. Furthermore, around 15% of the girls indicated that they were “not sure” whether girls had a meaningful role in this regard.

4.1.15 Perception of Rising Temperature in Dhaka

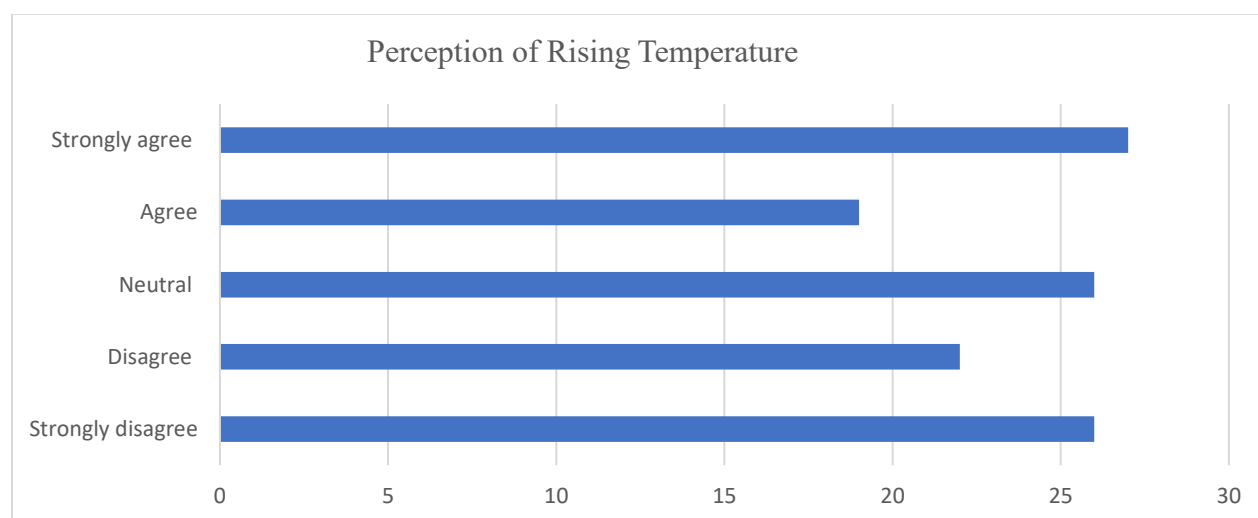


Figure 16: Perception of Rising Temperature

As illustrated by the bar chart, responses on the Likert scale displayed a diverse and varied pattern, reflecting a wide range of opinions among participants. Specifically, 26 individuals selected “Strongly Disagree,” indicating a significant group who either strongly reject the statement or have very limited awareness or familiarity with the issue being investigated. Although the exact number of participants who chose “Disagree” is unspecified, this category likely captures additional respondents with partial disagreement or skepticism. Interestingly, 26 participants reported a neutral position, suggesting ambivalence, uncertainty, or a lack of sufficient information to form a definitive opinion. Furthermore, 19 individuals selected “Agree,” and 27 participants chose

“Strongly Agree,” showing that a substantial portion of respondents recognize, accept, or align with the statement or concept presented. Overall, these statistics highlight the range of consciousness, beliefs, and experiences among participants, providing important insights into knowledge gaps, areas of contention, and potential directions for targeted interventions or educational efforts related to the subject of inquiry.

4.1.16 Fire Frequency Belie

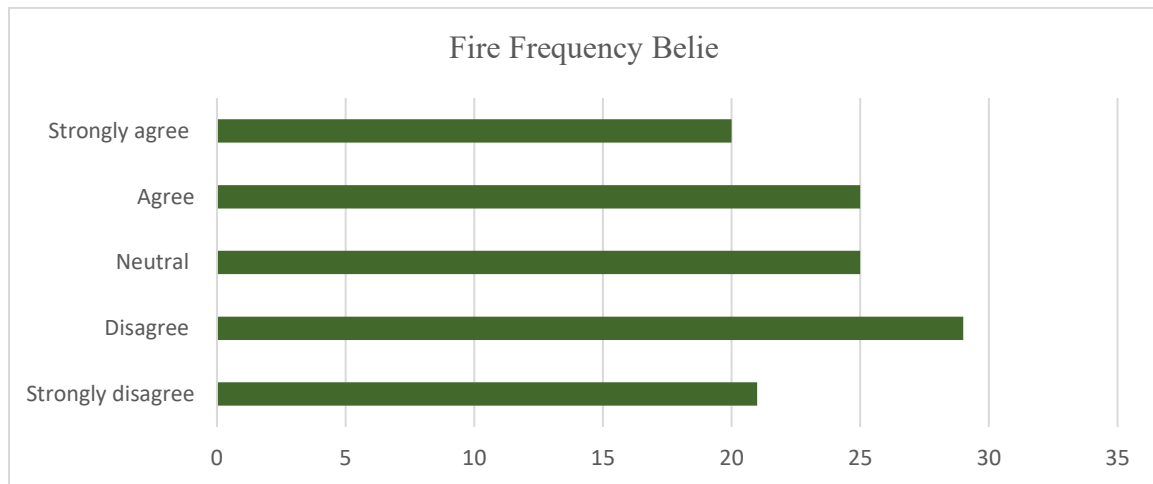


Figure 17: Fire Frequency Belie

The bar chart shows how the responses were spread out using a Likert scale, which shows that the participants had a wide range of opinions. 21 people chose "Strongly Disagree," which means that many people either don't support the statement or issue being discussed or don't know much about it. Another 29 people said "Disagree," which shows that there is a lot of doubt or disagreement. Interestingly, 25 participants reported a neutral stance, indicating ambivalence or uncertainty, which may signify insufficient exposure, limited information, or conflicting experiences pertaining to the subject. Conversely, 25 respondents indicated 'Agree,' and 20 respondents expressed 'Strongly Agree,' signifying that a significant proportion of participants recognize, endorse, or concur with the statement. In general, these data show that people have different views, beliefs, and experiences. This shows that some participants are aware and supportive, while others are still not convinced or sure. The patterns in the chart can help find areas where more information is needed, suggest specific actions to take, and point out the way for more research into what causes these attitudes.

4.1.17 Living Condition Impact

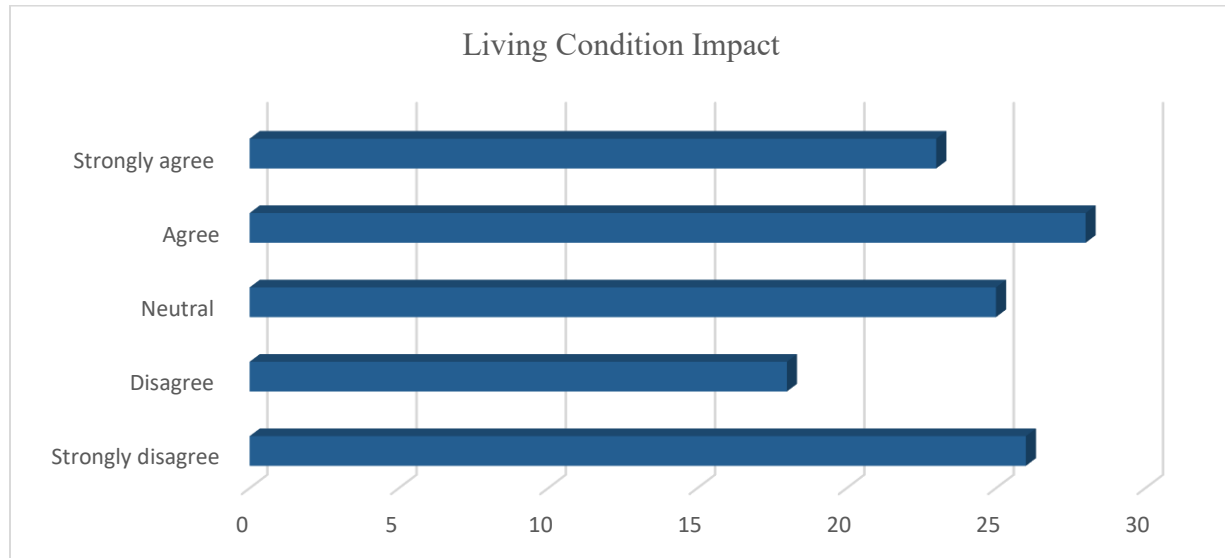


Figure 18: Living Condition Impact

The bar chart shows that the responses of the participants varied widely on the Likert scale. This shows that they had different levels of knowledge, beliefs, or experiences about the topic being studied. 26 respondents chose "Strongly Disagree," which is many people who either strongly disagree with the statement or issue or don't understand it very well. Another 18 people said they "disagree," which shows even more doubt or disagreement. This means that almost half of the people who answered have negative or cautious views. Interestingly, 25 people chose the neutral option, which shows that there is a large group that may not have made up their minds, may not know, or may not care, which could be due to gaps in knowledge or not having enough access to relevant information.

On the other end of the scale, 28 people said "Agree" and 23 said "Strongly Agree," which shows that many people agree with, support, or agree with the statement. In general, these results show a complicated mix of attitudes, with some people disagreeing, some being unsure, and some agreeing. This distribution gives us useful information about how participants see things, shows us where people might not be aware of or educated about the issue, and gives us ideas for interventions that could help people learn more, understand more, or get more involved.

4.1.18 Safety Worry of the respondents

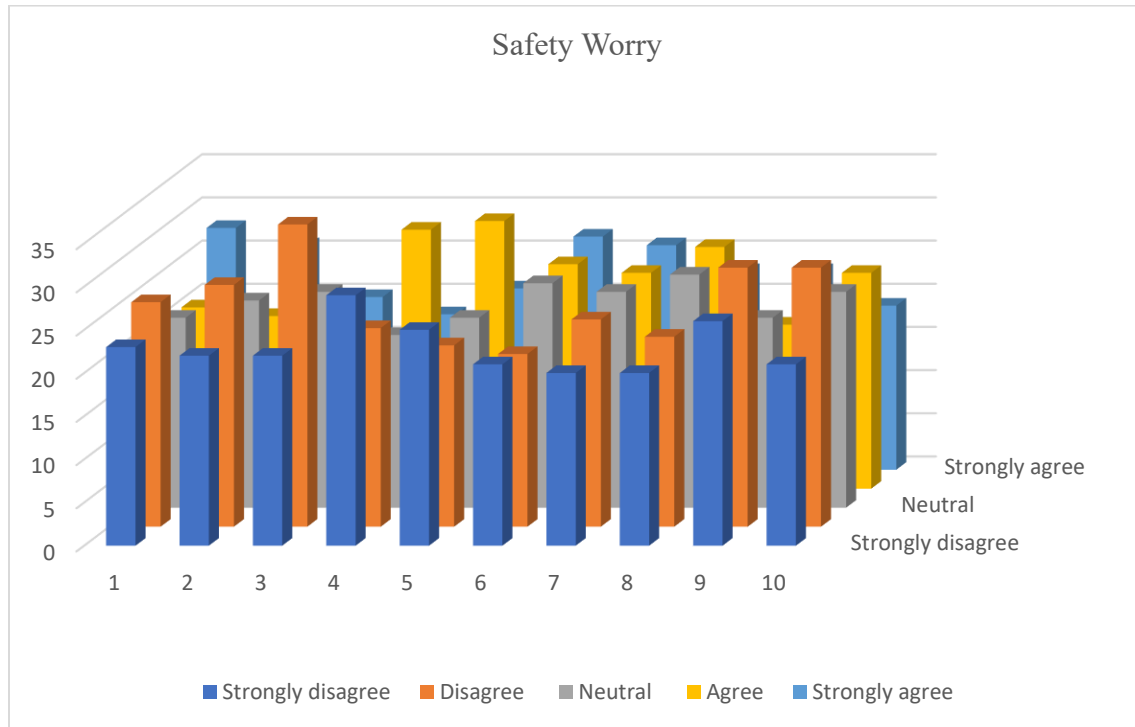


Figure 19: Safety Worry

The bar chart shows that Likert scale responses varied widely. 21 participants chose 'Strongly Disagree' and 30 chose 'Disagree' and 25 people chose neutral. There were 25 "Agree" responses, and 19 "Strongly Agree." These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.19 Gendered Impact Perception

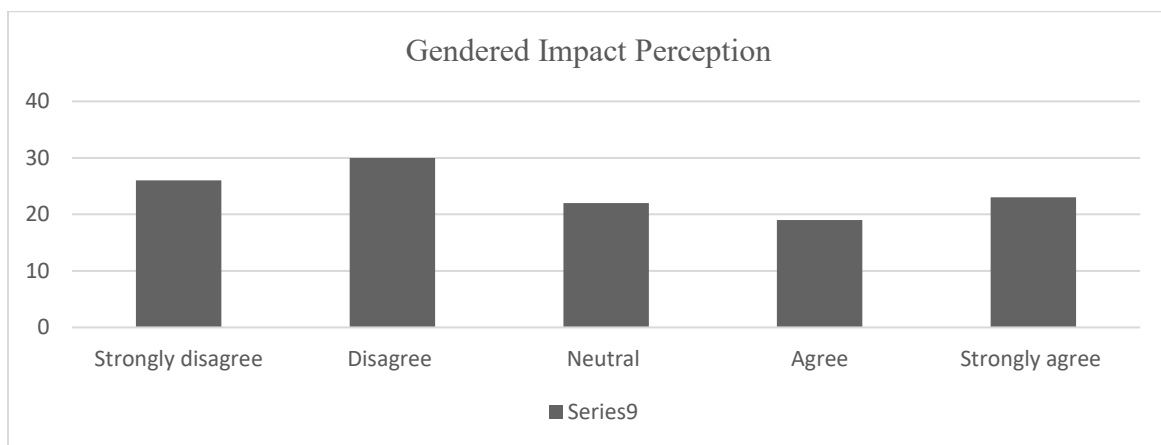


Figure 20: Gendered Impact Perception

This bar chart shows that Likert scale responses varied widely. "Strongly Disagree" was chosen by 26 people and "Disagree" by 30. Twenty-two people chose neutral while 19 people said "Agree" and 23 said "Strongly Agree". These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.20 School/Work Impact

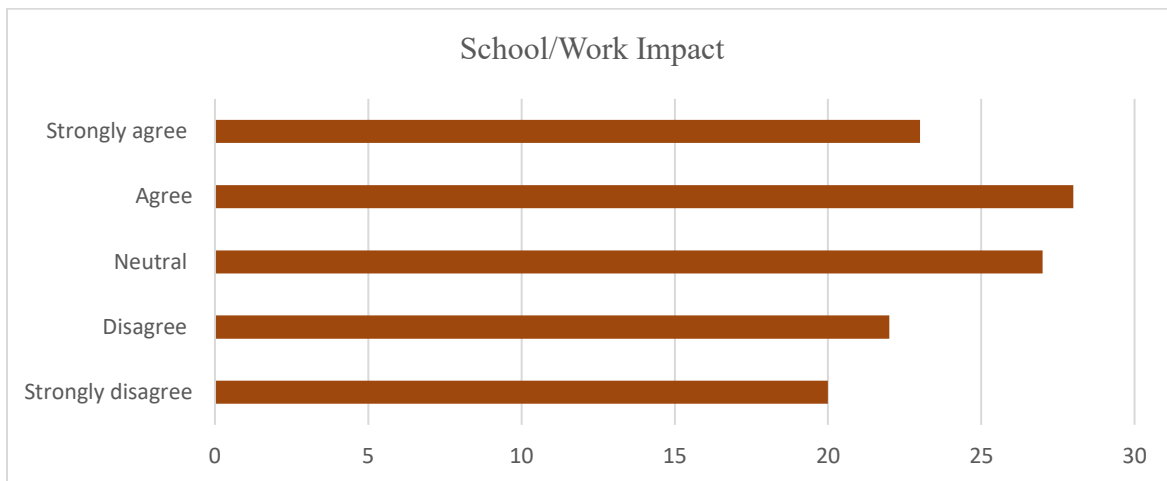


Figure 21: School? Work impact

This bar chart shows that Likert scale responses varied widely. Twenty individuals chose "Strongly Disagree," while twenty-two chose "Disagree." Twenty-seven chose the non-preference option. 28 individuals said "Agree," and 23 said "Strongly Agree." These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.21 Knowledge Rating of the Respondents

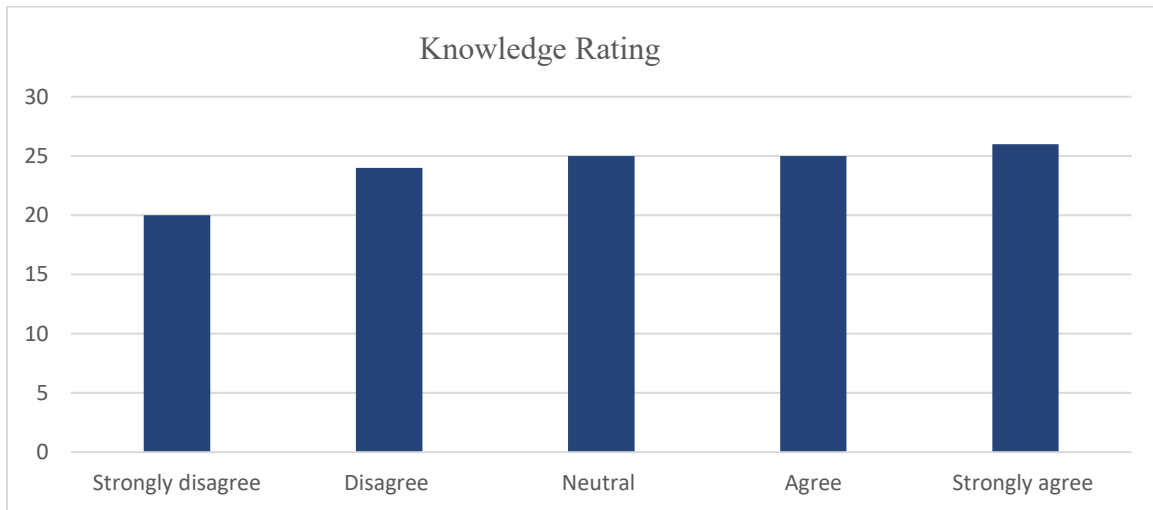


Figure 22: Knowledge Rating

This bar chart shows that Likert scale responses varied widely. 21 voted 'Strongly Disagree' and 24 chose 'Disagree'. Twenty-five people chose neutral, while 25 respondents chose "Agree" and 26 chose "Strongly Agree." These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.22 Knows Fire Response

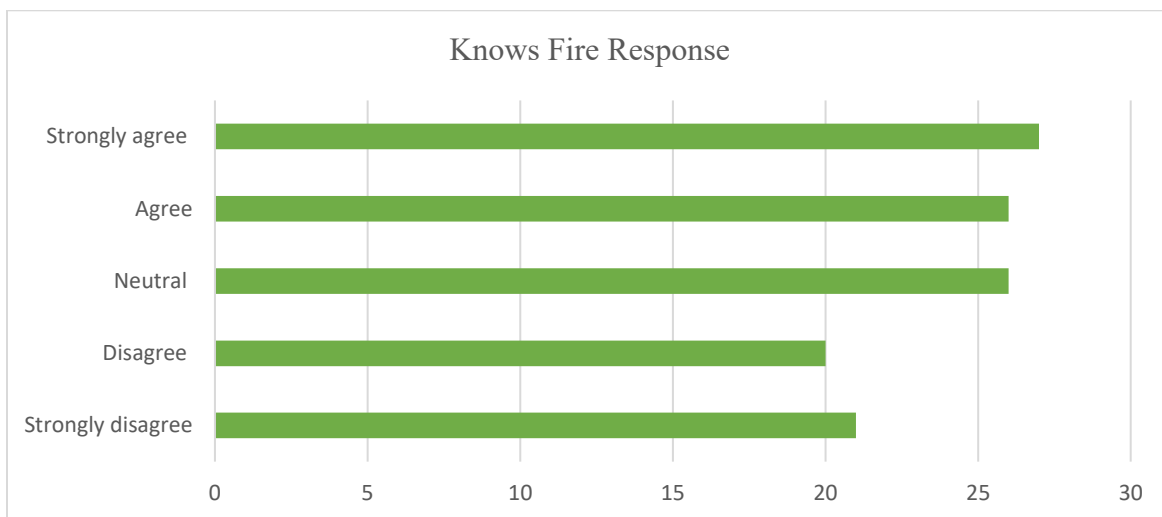


Figure 23: Knows Fire Response

This bar chart shows that Likert scale responses varied widely. 'Disagree' was chosen by 21 people and 'Disagree' by 20. 27 chose neutral while a total of 26 respondents chose 'Agree' and 27 chose

'Strongly Agree'. These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.23 Fire Safety at Home

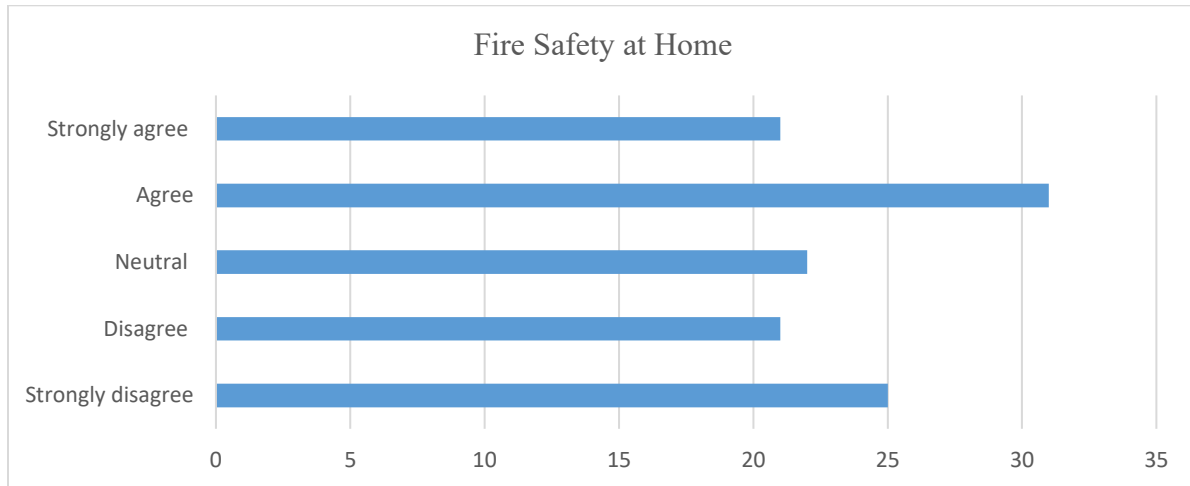


Figure 24: Fire Safety at Home

The above bar chart shows that Likert scale responses varied widely. Twenty-five individuals chose 'Strongly Disagree' and 21 chose 'Disagree'. Twenty-two people chose neutral while the total number of 'Agree' responses was 31, while 21 answered 'Strongly Agree'. These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.24 Heat Protection Knowledge

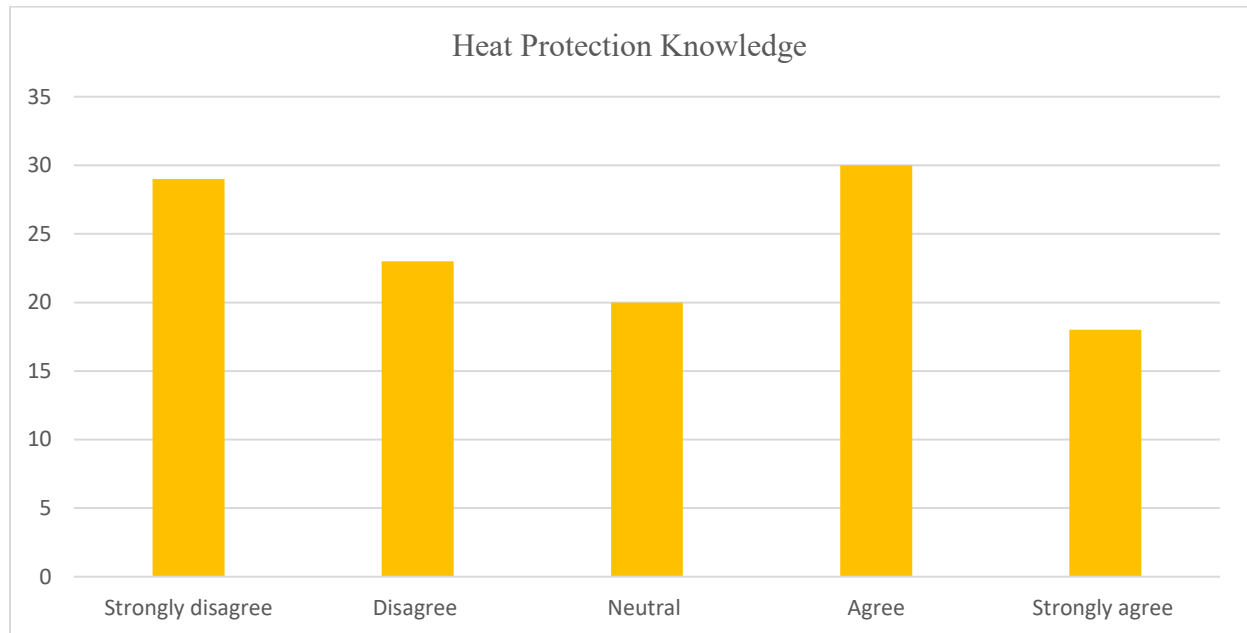


Figure 25: Heat Protection Knowledge

The bar chart shows that Likert scale responses varied widely. The total number of 'Strongly Disagree' respondents was 29, while 23 chose 'Disagree'. One hundred twenty chose neutral while Thirty respondents chose 'Agree' and 18 chose 'Strongly Agree'. These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.25 Access to Cool Place

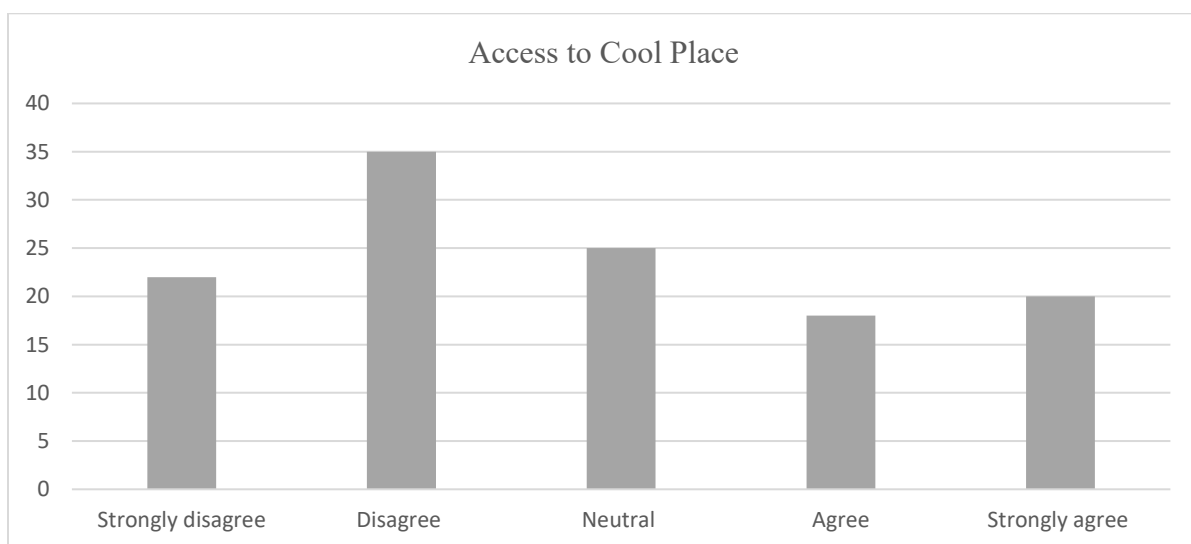


Figure 26: Access to Cool Place

The above bar chart shows that Likert scale responses varied widely. People chose "Strongly Disagree" 22 times and "Disagree" 35 times, while 18 respondents chose "Agree" and 20 chose "Strongly Agree." Twenty-five people chose neutral. These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.26 Community Support

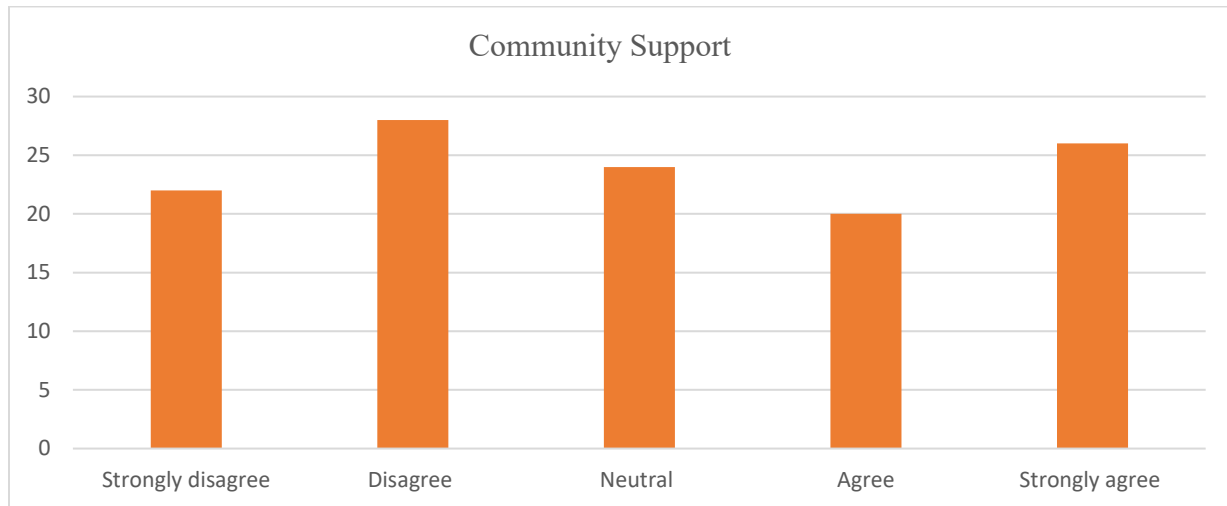


Figure 27:Community Support

The bar chart shows a wide range of responses on the Likert scale, which shows that the participants had different opinions and experiences. 22 people chose "Strongly Disagree," which shows that a significant number of people either strongly disagree with the statement or don't know much about or understand the issue being discussed. Another 28 people said "Disagree," which shows that there is more doubt or partial disagreement in the group. At the same time, 24 people chose a neutral answer, which shows that some people may not be sure, have mixed feelings, or don't have enough information to make a strong opinion.

On the other hand, 26 people chose "Agree" and another 26 chose "Strongly Agree," showing that many people who answered the question support, accept, or agree with the statement. Overall, these results show that people have different beliefs, levels of awareness, and experiences, which means that there are both gaps in knowledge and areas of strong agreement. The data offers significant insights for discerning trends in participants' perceptions and can guide strategies to improve awareness, engagement, or education regarding the subject.

4.1.27 Financial Recovery Ability

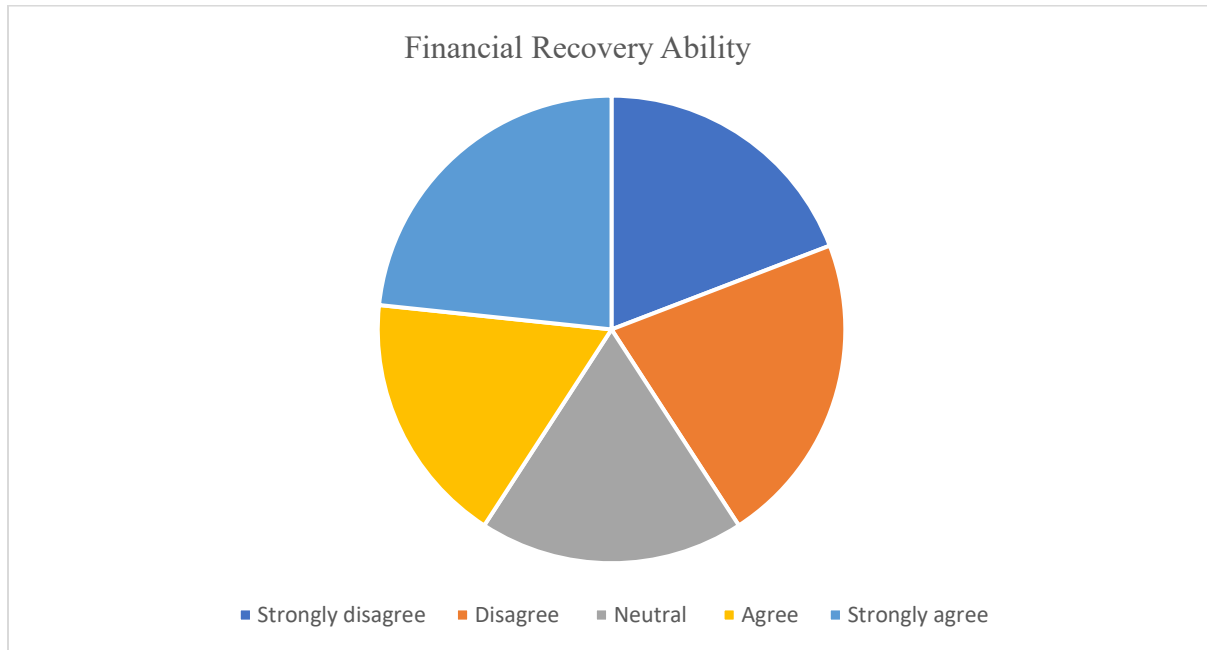


Figure 28: Financial Recovery Ability

This pie chart shows that Likert scale options had many different answer patterns. "Strongly Disagree" was chosen by 23 people and "Disagree" by 26. Twenty-two people chose neutral, while 21 respondents chose "Agree" and 28 chose "Strongly Agree." These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.28 Emergency Savings

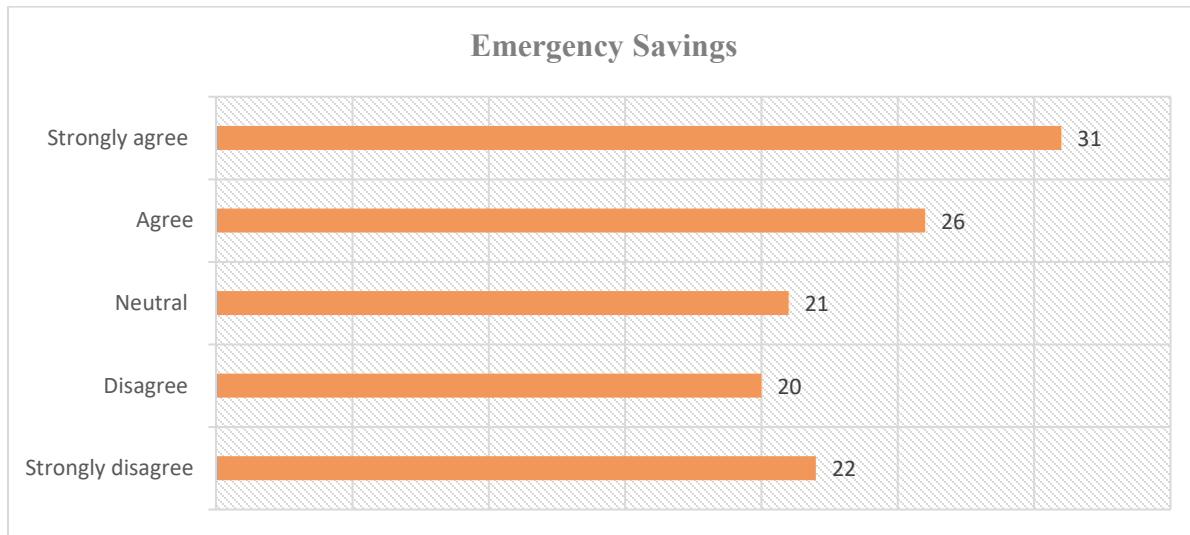


Figure 29: Emergency Savings

The bar chart shows that Likert scale responses varied widely. "Strongly Disagree" was chosen by 22 people and "Disagree" by 20. Twenty-one people chose neutral. 26 respondents chose "Agree" while 31 chose "Strongly Agree." These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.29 NGO/ Government Support

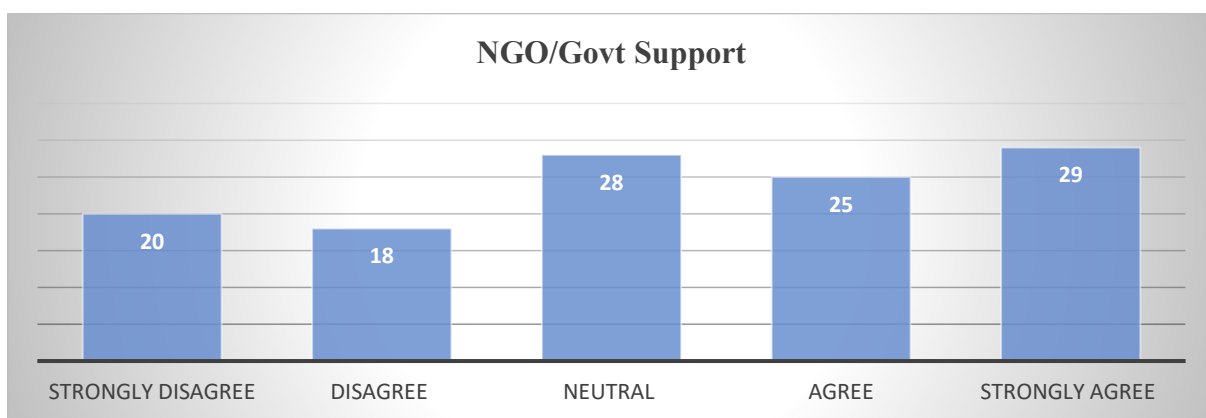


Figure 30: NGO/ Government Support

The above bar chart shows that Likert scale responses varied widely. Twenty individuals voted 'Strongly Disagree' and 18 chose 'Disagree'. Neutral was chosen by 28 people, while 25 people said "Agree" and 29 said "Strongly Agree". These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.30 Institutional Trust

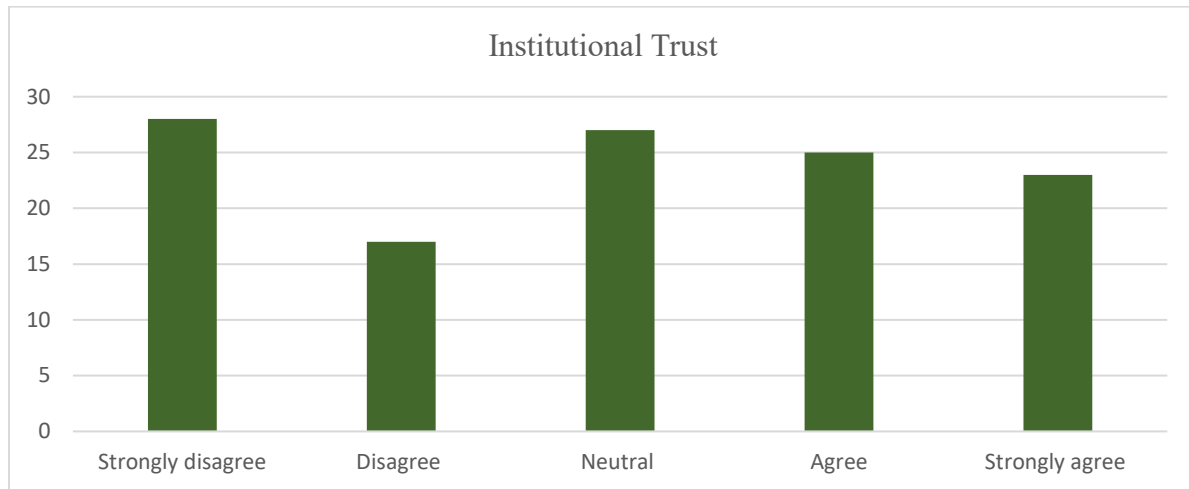


Figure 31: Institutional Trust

This bar chart shows that Likert scale responses varied widely. 28 individuals chose 'Strongly Disagree' and seventeen chose 'Disagree', while twenty-seven chose the non-preference option. There were 25 to 23 "Agree" responses, with 23 "Strongly Agree." These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.31 Safety Training Received

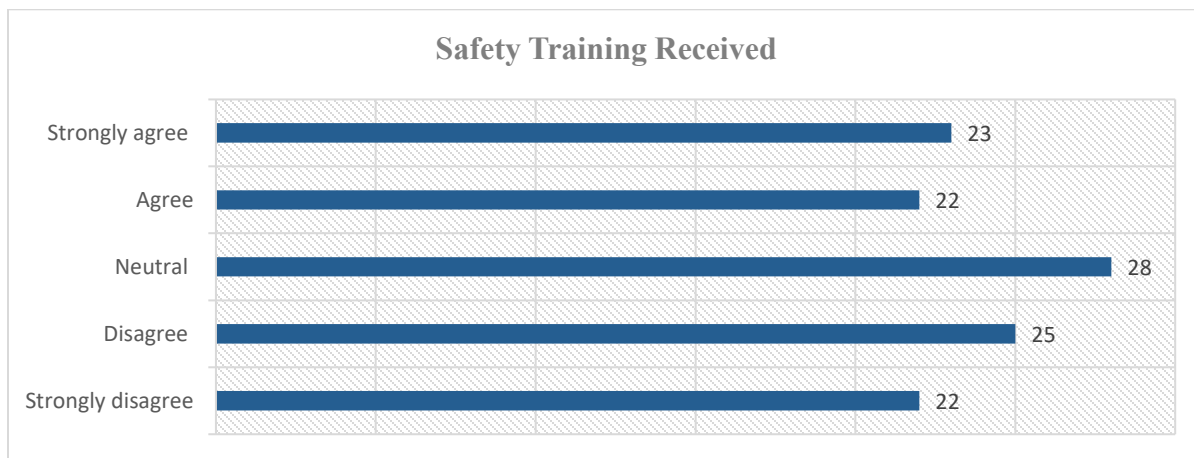


Figure 32: Safety Training Received

This bar chart shows that Likert scale responses varied widely. Only 22 individuals voted 'Strongly Disagree', while 25 chose 'Disagree'. Neutral was chosen by 28 people, while 22 respondents chose 'Agree' and 23 chose 'Strongly Agree'. These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.32 Scared About Disasters

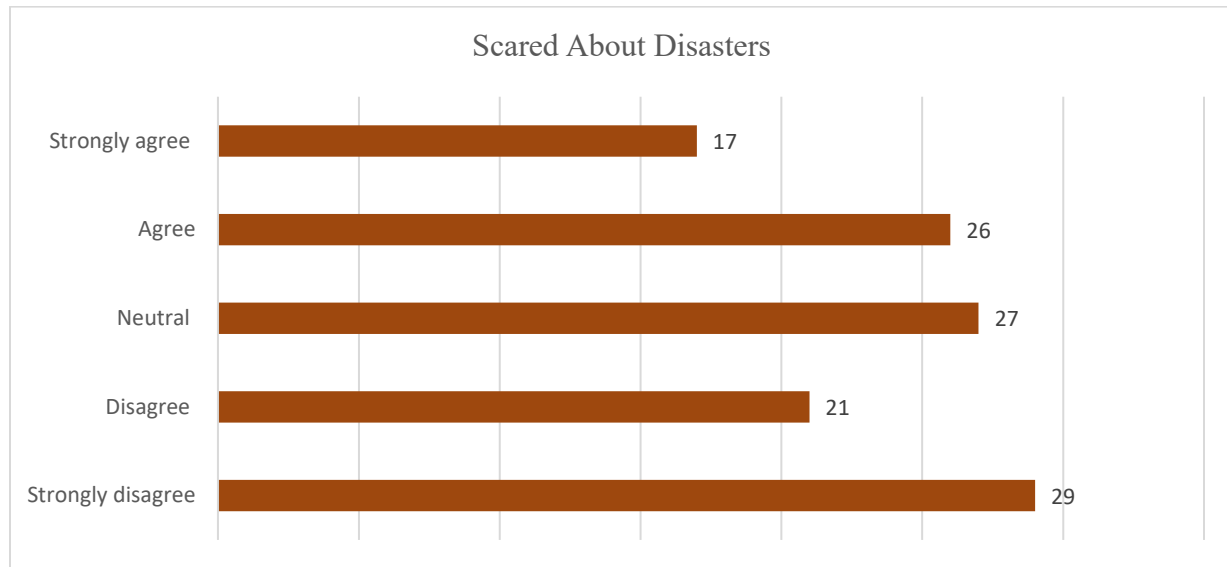


Figure 33: Scared About Disasters

This bar chart illustrates a wide range of responses on the Likert scale, highlighting the diversity of opinions, awareness, and experiences among participants. Specifically, 29 respondents selected “Strongly Disagree,” reflecting a substantial group that either strongly rejects the statement or has very limited knowledge or familiarity with the issue under consideration. Another 21 participants chose “Disagree,” indicating additional skepticism or partial disagreement, which suggests that a significant portion of respondents hold cautious or negative perceptions. Interestingly, 27 participants selected the no-preference or neutral option, pointing to ambivalence, uncertainty, or insufficient information to form a definitive opinion.

On the other side of the scale, 26 respondents chose “Agree,” and 17 chose “Strongly Agree,” demonstrating that a meaningful segment of participants recognizes, supports, or aligns with the statement. Overall, these results reveal a complex distribution of awareness, beliefs, and experiences, highlighting both areas where knowledge or confidence may be lacking and areas where participants are more informed or supportive. The data provides valuable insights into participant perspectives, offering guidance for targeted interventions, educational programs, or awareness campaigns aimed at addressing gaps and reinforcing positive trends.

4.1.33 Sleep/Focus Difficulty

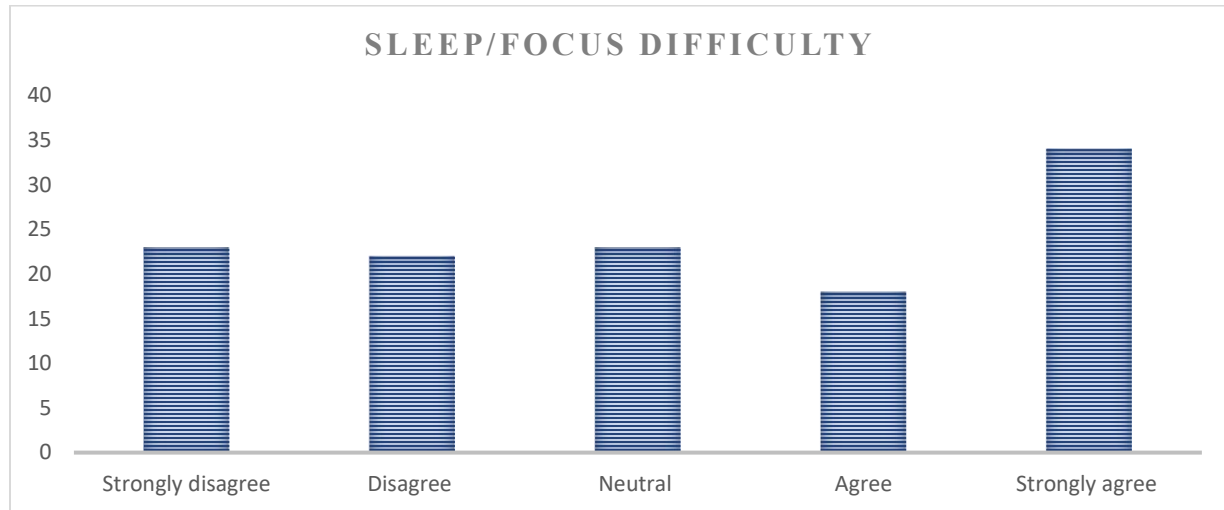


Figure 34: Sleep/Focus Difficulty

This bar chart shows that Likert scale responses varied widely. There were 23 'Strongly Disagree' responses and 22 'Disagree' responses, while twenty-three people chose neutral. 18 respondents chose "Agree" and 34 chose "Strongly Agree." These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.34 Emotionally Affected by Fire

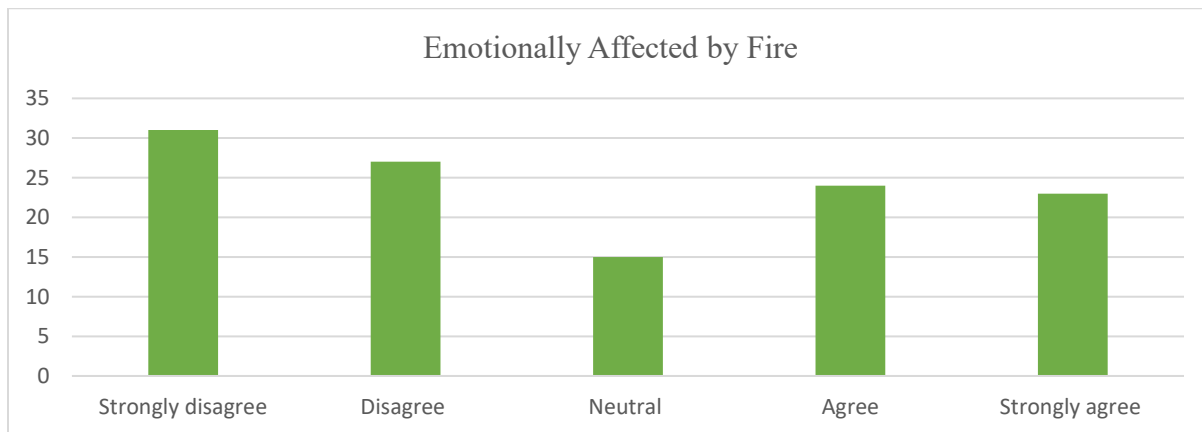


Figure 35: Emotionally Affected by Fire

This bar chart shows that Likert scale responses varied greatly. Among 31 respondents, 'Strongly Disagree' was chosen, while 27 chose 'Disagree', while fifteen chose neutral. The number of 'Agree' responses was 24, and 23 chose 'Strongly Agree'. These data show participants' views and demonstrate trends in awareness, belief, or experience, depending on the inquiry.

4.1.35 Talks to Other

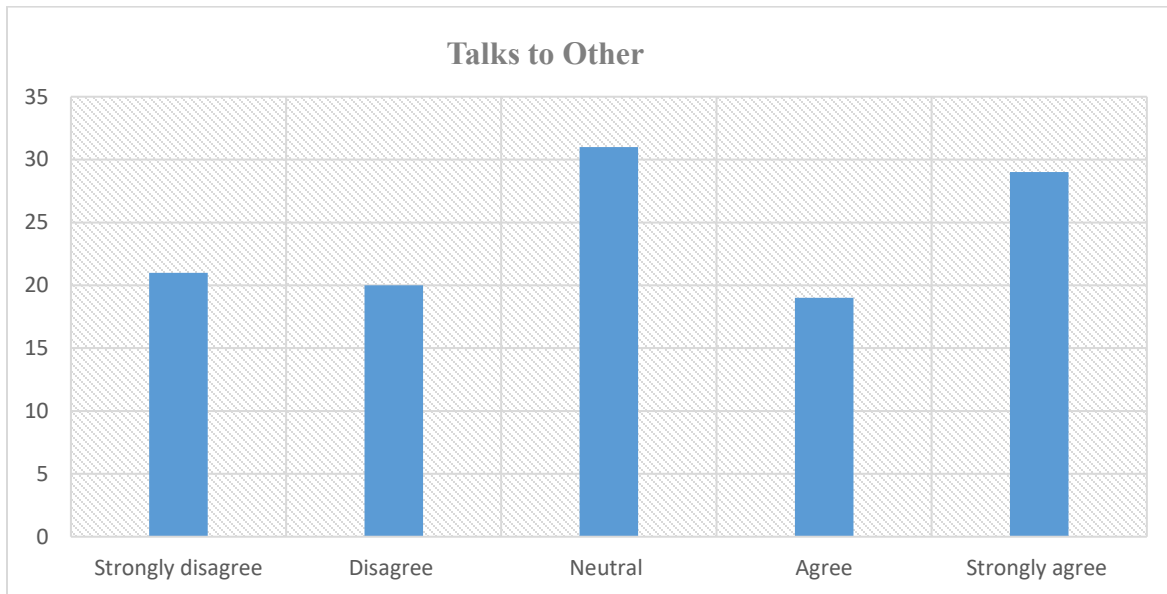


Figure 36: Talks to Other

The bar chart shows that the responses were spread out across the Likert scale, which shows that the participants had a wide range of views. Specifically, 21 respondents chose "Strongly Disagree," which means that a significant number of people either strongly oppose the issue being discussed or don't fully understand it. Twenty more people chose "Disagree," which shows that they were even more skeptical or only partially disagreed. It's interesting that the biggest group, which had 31 people, chose the neutral option. This could mean that they were unsure, didn't have enough information to make a clear choice, or were ambivalent.

On the positive side, 19 people said "Agree" and 29 said "Strongly Agree," which shows that many people agree with, accept, or connect with the statement or idea. Overall, these data show that the group has a wide range of levels of awareness, beliefs, and experiences. Some areas are very similar, while others have gaps in knowledge or are hesitant. Understanding these patterns gives us useful information for spotting changes in perception, planning targeted interventions, and creating educational or awareness programs that meet the needs of the participants.

4.1.36 Mental Strength

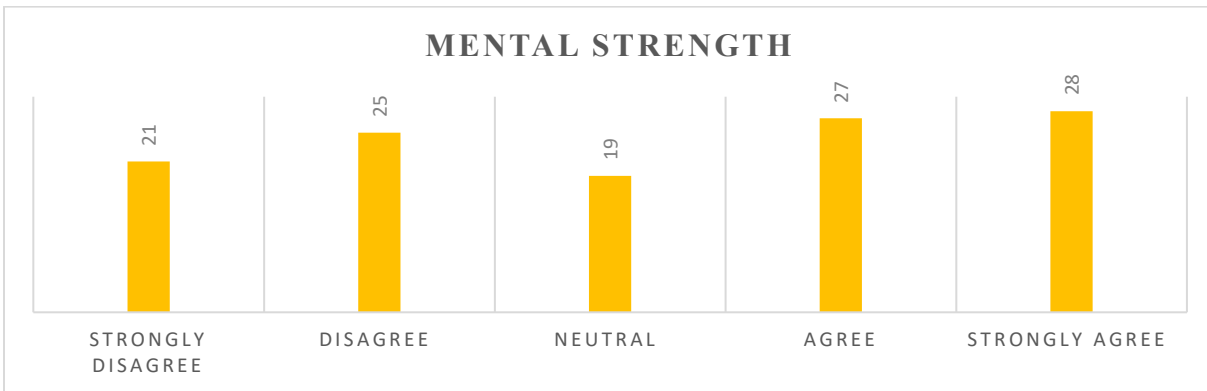


Figure 37: Mental Strength

This bar chart shows that Likert scale responses varied widely. 21 participants chose 'Strongly Disagree' and 25 chose 'Disagree', while large proportion.119, chose neutral. 27 people said "Agree" and 28 said "Strongly Agree". These data reveal participant perspectives and help identify trends, which may relate to consciousness, belief, or experience, depending on the inquiry.

3.1.37 Self-Preparedness Rating

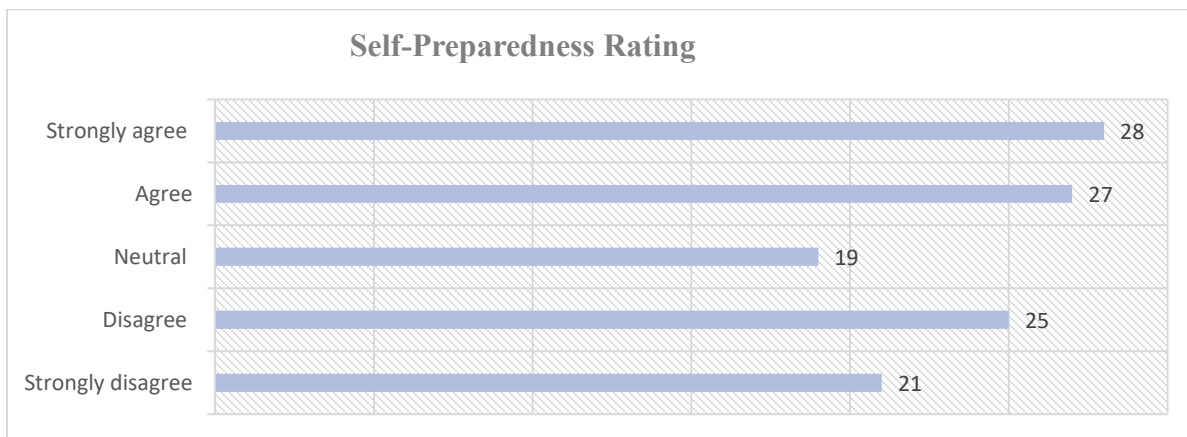


Figure 38: Self-Preparedness Rating

The bar chart illustrates that response patterns varied significantly across the Likert scale options. A total of 24 participants selected 'Strongly Disagree', while 26 chose 'Disagree'. The neutral option was selected by 17 individuals. Those who 'Agree' numbered 31, and 22 respondents chose 'Strongly Agree'. These figures indicate the distribution of perceptions among participants and help reveal trends, either in awareness, belief, or experience, depending on the context of the question here.

4.2 Qualitative data analysis

The qualitative component of this study was a crucial step in understanding the deeper, often hidden, layers of climate vulnerability faced by adolescent girls in Dhaka's Korail slum. Using Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs), the research gathered personal stories, firsthand reflections, and community-level insights. The analysis followed a thematic approach, where data were meticulously reviewed to identify recurring patterns, experiences, and ideas. These were organized into broad thematic areas and then refined into sub-themes that captured the specific ways in which climate change intersects with gender, age, and socio-economic conditions in this urban slum context. The voices and narratives collected revealed not only the risks these girls face but also the strength and strategies they deploy to survive and dream beyond adversity.

Theme 1: Exposure to Climate-Induced Risks

Among the many concerns voiced by participants, the most immediate and pressing was their direct exposure to climate-related hazards. Two recurring risks, fire outbreaks and extreme heat, were mentioned by nearly every group. These environmental stressors are not only common but have become deeply embedded in the daily lives of adolescent girls in Korail, disrupting everything from their health and safety to their ability to sleep, attend school, and feel secure in their homes.

1.1 Fire Outbreaks

Fire is not an occasional event in Korail, it is a constant threat. The densely packed houses, built from flimsy and flammable materials like tin sheets and bamboo, create a dangerous setting where one small spark can turn into a neighborhood-wide disaster. Faulty wiring, open flames used for cooking, and the lack of fire safety equipment make the area particularly vulnerable.

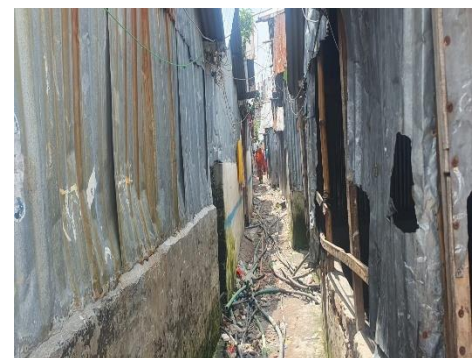


Figure 39: Ruins of fire

One adolescent girl shared a chilling reality:

“Fires are so common here that we always keep water buckets ready” (FGD, 1, November 2024).

An NGO worker added context to this sense of preparedness,

“We had to evacuate twice due to slum fires. Everything burned down in minutes” (KII,3, November 2024).

The stories reflected not just the physical devastation that fire brings, but also the psychological toll it takes, living with the daily fear that everything could be lost in a moment. The emotional exhaustion caused by this ever-present risk forms an invisible layer of suffering that many outsiders might not see.

1.2 Rising Heat Exposure

Alongside the risk of fire, **extreme heat** has become a growing source of distress, especially during the long, humid summer months. For many girls, heat is more than an inconvenience, it is a health hazard. It interferes with their sleep, makes daily chores and movement unbearable, and exacerbates existing health issues like skin infections and dehydration.



Figure 40: Heat exposure

A 14-year-old girl described her nightly struggle:

“I can’t sleep at night during summer, it’s too hot and suffocating” (FGD, 1, November 2024).

A local health worker emphasized the seriousness of the issue, stating:

“Heat stress is now as harmful as any disease for children here” (KII,1, November 2024).

These remarks highlight how climate change is turning basic aspects of life, like sleep, rest, and comfort, into ongoing challenges. The slum’s infrastructure does not offer relief from the heat, and the girls are often the last to access even minimal comfort due to social and gender hierarchies in resource use.

Theme 2: Gendered Vulnerability

Environmental risks in Korail do not affect all residents equally. Gendered vulnerability is a central theme that emerged, illustrating how adolescent girls face unique and disproportionate challenges

during climate-induced crises. Whether it's escaping during a fire or managing menstrual hygiene during a heatwave, girls bear the brunt of climate-related disruptions in ways that often go unnoticed or unaddressed.

2.1 Safety & Mobility Constraints

Emergencies such as fires require fast evacuation. But for adolescent girls, fleeing is not just about getting to safety, it often involves navigating crowded, chaotic, and unsafe spaces, where their personal safety and dignity are put at risk. Girls reported facing harassment, unwanted physical contact, and anxiety during these moments of panic.

As one 16-year-old participant described:

“When fire breaks out, girls face harassment in the crowd while escaping” (FGD, 2, November 2024).



Figure 41: Mobility space

These experiences are a stark reminder that the intersection of climate hazards and gender-based social norms amplifies risk. Girls must not only survive the environmental threat but also contend with the additional dangers posed by a lack of safe, gender-sensitive emergency protocols.

2.2 Health & Hygiene Challenges

The study also highlighted that climate events further limit access to safe and private sanitation facilities, especially during menstruation. Girls often lack menstrual hygiene products and are unable to change or clean themselves in private, especially during evacuations or extreme heat conditions.

A female teacher participating in a KII emphasized:

“There are no private or clean spaces for girls during heatwaves or disasters” (KII,5, November 2024).



Figure 42: Hygiene situation of the slum

This lack of basic menstrual dignity creates physical discomfort and emotional stress, often causing girls to isolate themselves, miss school, or avoid relief spaces altogether. It also underscores the need for gender-responsive disaster planning.

Theme 3: Coping and Adaptation Strategies

In the face of adversity, the girls and families in Korail demonstrate extraordinary resilience. Lacking formal support, they have developed informal, community-based coping mechanisms that allow them to survive. These strategies, while limited in technical capacity, show strong adaptation rooted in local knowledge, experience, and communal learning.

3.1 Household Fire Preparedness

With no access to fire extinguishers or formal fire safety training, families have had to be resourceful. Simple tools like buckets of water, wet cloths, and sand have become the first line of defense during fire emergencies.

One 15-year-old girl shared:

“We don’t have extinguishers, but we throw water and cover fire with wet cloths” (FGD, 2, November 2024).

This kind of self-taught risk management reveals both the limitations of institutional neglect and the ingenuity of community-lead responses. It also highlights a significant opportunity: if these communities were provided with proper tools and training, they could greatly enhance their safety.

3.2 Heat Stress Adaptation

To cope with unbearable heat, families modify their routines. Many girls stay outdoors until late at night or sleep in more ventilated common areas to escape the stifling conditions inside their homes.

A 13-year-old participant explained:

“We sit outside until midnight during summer just to breathe properly” (FGD, 2, November 2024).



Figure 43: Spending time outside of house

These adaptations may seem minor, but they are a powerful testament to the community’s ability to respond to environmental changes with minimal resources. Still, they also underline how urgently these families need structural support—cooling spaces, fans, or shaded community centers.

Theme 4: Institutional Support and Gaps

Despite living in one of Dhaka's most vulnerable neighborhoods, the girls and their families in Korail receive little to no formal support when it comes to climate resilience. This theme emerged strongly during KIIs, where officials, teachers, and community leaders spoke openly about the gaps in institutional response.

4.1 Limited Emergency Services

The **physical layout of Korail**, with its extremely narrow lanes and lack of proper access roads, means emergency responders often cannot reach disaster zones in time. This not only delays assistance but can lead to preventable loss of life and property.



Figure 44: Narrow space

A fire service official acknowledged:

“Even when fire trucks arrive, they can’t enter the narrow paths” (KII,5, November 2024).

4.2 Inadequate Training and Awareness

Many girls reported that they had never received formal training on how to respond during fires or extreme heat events. This lack of structured education leaves them feeling unprepared and anxious during emergencies.



Figure 45: Training and awareness

“We’ve never been taught what to do in case of a fire or heatstroke” (FGD, 2, November 2024).

The absence of training is a missing opportunity for empowerment, especially given how eager many girls are to learn.

4.3 Health and Mental Support Gaps

After the disaster strike, mental health support is almost entirely absent. Girls describe being left to process trauma, such as losing belongings or witnessing destruction, on their own. Key informants confirmed that psychological care is not a priority in post-disaster response.



Figure 46: Expression of health status

A health NGO worker observed:

“The girls cry a lot after losing things in fires, but no one comes to talk to them” (KII,3, November 2024).

This points to the urgent need for community-based mental health support programs, especially for adolescent girls who often internalize trauma without visible signs.

Theme 5: Resilience and Aspirations

Despite all challenges, a recurring and uplifting theme was the strong inner resilience and hope shown by the girls of Korail. They are not passive victims but active agents of change, eager to learn, contribute, and lead.

5.1 Mental Strength and Willingness to Learn

Many girls voiced a strong desire to be included in climate education and community training. They want tools, not just to survive, but to grow. They see education and awareness as paths to empowerment.



Figure 47: Willingness to learn

A 17-year-old said with conviction:

“We want to know more about climate change. We are strong, but we need training” (FGD, 2, November 2024).

This hunger for knowledge and involvement suggests that investing in these girls could yield long-term dividends for community resilience.

5.2 Community Support Networks

In the absence of formal help, community solidarity becomes the safety net. Neighbors are often the first responders during fires, the caregivers after disasters, and the support system for one another.

A community leader shared:



Figure 48: Community Networks

“When something happens, neighbors run first, not the authorities” (KII,2, November 2024).

This deep-rooted sense of mutual aid is one of the community’s greatest strengths. However, relying on neighborly help alone is not sustainable; formal systems need to recognize and bolster this resilience.

CHAPTER FIVE

Discussion

The study revealed the substantial educational, socioeconomic, and environmental vulnerabilities of female adolescents of slum dwellers. Moreover, 60% of adolescent girls were not now enrolled in school, indicating a significant dropout rate, maybe related to the indifference of the household, early marriage, or lack of access to education. Educational discontinuity among urban slum girls is frequently associated with systemic poverty, insecurity, and environmental disturbances (UNICEF, 2021). Furthermore, 54.2% of respondents had attained only primary school, signifying a tenuous basis for prospects.

A large portion of the respondents are employed in low-wage occupations, mainly in garment labor and domestic assistance, with 34.2% identifying as garment workers. A garment worker is defined as a low-income earner with a high cost of work. Working in the garment industry provides minimal economic security, subjecting adolescent females to an exploitative situation (Akhter et al., 2019). Compounding their vulnerability, 60% of participants reported household earnings below BDT 5,000 per month, far below the national poverty threshold (World Bank, 2020). These socio-economic situations diminish their ability to adjust to climate-related stressors.

Exposure to risks of disaster is pervasive among the respondents of the study. A concerning 72.5% of participants reported experiencing at least one fire incident, while 90% reported feeling the impact of excessive heat. The elevated incidence of fire and heat exposure signifies the hazardous situation of slums, marked by improvised dwellings, inadequate infrastructure, and overcrowding (Roy, 2011). Informal settlements are disproportionately vulnerable to climate risks due to ineffective enforcement of building regulations and insufficient disaster risk reduction infrastructure and approaches (Parvin et al., 2013).

Along with the quantitative data, qualitative studies corroborate these data points and offer a more profound understanding of gendered vulnerability. Adolescent females encounter harassment and safety risks during fire evacuations, with participants emphasizing the absence of secure environments and dignity-preserving alternatives in disastrous scenarios. The issues of menstrual hygiene and the lack of clean, private facilities intensify these hazards. Alam and Rahman (2021)

assert that gender-specific vulnerabilities frequently remain unacknowledged in emergency preparedness frameworks, therefore sustaining cycles of risk and marginalization.

Notwithstanding these obstacles, the girls exhibited tenacity and ingenuity. Numerous families employ informal coping strategies, like the utilization of buckets or plastic fans. Approximately 50% of participants had engaged in climate training, which is organized by NGOs to promote disaster preparedness. Involvement of NGOs in disaster preparedness underscores the crucial function of civil society in addressing institutional deficiencies in disaster management. Nonetheless, government participation is minimal, with merely 28 participants citing government-sponsored training programs for disaster preparedness. NGOs frequently assume a pivotal role in community-based climate adaptation in Bangladesh, particularly in areas where formal institutions are ineffective (Kabir et al., 2020).

In case of assessing the awareness and perception concerning climate impacts, approximately 50% of respondents the notion that females play a part in climate action, while 35% disagreed, and 15% were uncertain. This ambivalence may stem from dominant gender stereotypes, insufficient exposure to role models, or a deficiency in empowerment initiatives. A significant proportion of respondents emphatically concurred that they were deprived of emergency savings, adequate cooling facilities, and mental health resources, highlighting deficiencies in systemic resilience infrastructure.

The thematic analysis also revealed institutional flaws in disaster management. Fire services frequently encounter difficulties accessing the slum due to constricted alleyways, and systematic training on disaster response is limited. A crucial informant observed that adolescent females often lack guidance on how to react during fires or heatwaves. These disparities emphasize the necessity for focused urban climate adaptation measures that are gender-sensitive and inclusive. Arora-Jonsson (2011) underscores that neglecting gender elements in environmental governance diminishes the efficacy of measures and may exacerbate the marginalization of disadvantaged populations.

Mental health has become a persistent issue. Females reported anxiety, insomnia, and emotional turmoil, especially following fire occurrences. Although our findings correspond with evidence connecting environmental stress to adolescent mental health (Sawyer et al., 2012), the absence of post-disaster psychological support in slum is concerning for vulnerable people. The WHO (2017)

asserts that mental health services are essential elements of disaster rehabilitation, particularly for youth subjected to repeated trauma.

Nevertheless, the survey also uncovered ambitions and considerable mental resilience in the face of disaster, as a multitude of girls articulated a wish to acquire further knowledge regarding climate change and to engage in community initiatives. More than 60 respondents expressed greater faith in community support during disasters than in formal institutions. This highlights the importance of social capital and community cohesion as adaptable resources in urban slum environments. Peer networks and informal groups frequently function as essential support systems in situations of institutional neglect (Banks et al., 2019).

Finally, it can be said that existing mechanisms collectively underscore a landscape of multifaceted risk mitigated by considerable community-driven resilience among adolescent girls. To achieve a more sustainable and equitable climate response, policy initiatives should prioritize enhancing institutional support, expanding gender-sensitive training, upgrading infrastructure in informal settlements, and incorporating mental health considerations into disaster preparation. The protection and empowerment of adolescent girls as leaders in climate resilience must be a primary objective in the development of inclusive urban resilience.

This research found that Korail Slum adolescent girls' susceptibility to climate change is linked to bigger sociopolitical and economic systems that perpetuate marginalization. In this scenario, vulnerability is founded in gender inequity, poverty, and institutional exclusion as well as environmental exposure. Teenage girls in Korail are active actors who negotiate hazards despite less resources, freedoms, and institutional safety nets compared to other adolescents. To redefine resilience as a dual concept, evaluate both communal outcome and individual empowerment. During this inquiry, it became clear that climate governance models do not consider adolescent female viewpoints.

Even though youth are increasingly recognized as players in climate action globally, Dhaka's municipal governance structure rarely addresses the unique vulnerabilities of adolescents, particularly girls. Lack of female voices in policymaking, disaster preparedness committees, and urban planning leads to gender-blind intervention planning. This loop is caused by their exclusion from planning. Exclusion damages resilience measures and reveals fundamental inequalities unrelated to power and representation. Progress requires a paradigm shift in climate adaptation

and resilience strategies that are purposefully inclusive, attentive to children and women, and seek to empower the underprivileged. This is vital for advancement.

The data also shows how important community-based and informal resilience tactics are. When adolescent girls were struggling, they often found strength in their classmates, neighbors, and resource sharing. "Everyday resilience" describes how impoverished communities establish and maintain themselves in difficult conditions. Official adaptation plans rarely consider these resilience categories. However, this resilience is weak and cannot replace governmental tasks. Instead of demanding responsibility from urban government institutions, overreliance on community coping mechanisms risks promoting the concept that slum dwellers must "manage on their own." Thus, community strengths must be combined with state-led structural improvements to build resilient systems that last.

This researcher also discovered the digital and informational divide, another major issue. Early warning systems, smartphone notifications, and digital platforms are becoming more crucial in Bangladesh as climate change adaptation efforts grow. Korail's adolescent girls remain marginalized by technology. This is due to restricted digital device access, literacy, and cultural movement and communication restrictions. Because of this, people are often excluded from the benefits of modern technologies. While infrastructure improvements are important, a gender-responsive digital inclusion plan is needed to close this gap and ensure that marginalized populations can access, understand, and use climate change information.

The psychosocial front of resilience is also important. Climate change shocks ruin homes and livelihoods, threaten future goals, decrease dignity, and increase mental stress. This often leads to teenage girls getting married earlier, having less mobility, and dropping out of school. Psychosocial resilience, optimism, agency, and peer network protect against depression without being obvious. Infrastructure-focused programs and policies ignore this significant issue. Resilience should be built by prioritizing education, life skills training, and mental health therapy for adolescent girls. These expenditures build adaptive capacities beyond risk response. These findings contribute to the larger climate justice and urban governance discussion. Informal settlements like Korail demonstrate the relationship between poverty, gendered vulnerability, and environmental precarity. Without land tenure, social protection, and inclusive governance reforms, climate resilience will remain fragmented and unequal. Justice dictates that adolescent females, who often

face the greatest challenges but have the least control, be prioritized in resilience design. This requires removing structural barriers, building participatory mechanisms, and using rights-based methods in urban climate adaptation. Resilience can only transform equality and justice into rapidly urbanizing cities like Dhaka if it is first raised from a technocratic aim. This is its only transforming path.

CHAPTER SIX

Conclusion and Recommendations

The participants in this study were young women from Dhaka's Korail slum, one of the most populous informal settlements. This study examined these girls' climate change sensitivity and resistance. The research used quantitative survey data and qualitative insights from focus group discussions (FGDs) and key informant interviews (KIIs) to discover the many challenges these young women face. These challenges include frequent fires, high heat, gender-related dangers, and limited institutional support. Adolescent girls are disproportionately affected by climate-related risks, the study found. Additionally, adolescent girls are excluded from mainstream disaster-resilience programs.

The quantitative data showed that 72.5% of respondents had been in fires and over 90% had been subjected to severe heat. This study supports the idea that this metropolitan area is more exposed to environmental dangers. However, only half of the girls had received climate change training. This revealed severe support system awareness and confidence gaps. Additionally, risk, preparation, and institutional trust judgments were very heterogeneous, revealing large gaps. Few respondents reported strong agreement on their understanding of safe locations and healing procedures and their availability with these services.

Qualitative findings improved understanding of these vulnerabilities. Girls suffer emotional stress, evacuation harassment, and inadequate hygiene during natural disasters. Women also report sexual harassment. They were resilient due to their eagerness to learn, informal coping methods, and strong social bonding through interactions. Informal resilience cannot replace structural help, which is fragmented and out of reach for many. Based on this research, adolescent girls in Korail are vulnerable and receive little assistance in the face of climate change challenges. They are active players who can boost their communities' climate resilience with the right tools and training.

This study highlights the gendered aspect of climate vulnerability in urban slums, as well as other climate vulnerability factors. Adolescent girls face hazards that policymakers often disregard. Due to their advanced age, dependence, and limited means, they are more at risk. Poverty, gender inequality, and insecure housing make them even more vulnerable. Accepting that resilience

approaches are not "one size fits all," but rather must be tailored to gender and age dynamics is crucial to addressing these difficulties.

Another important finding is linked to climate governance's institutional flaws. Korail has several NGOs, donor agencies, and municipal officials, but their efforts are fragmented and short-term. Unfortunately, there is no coordinated effort to involve adolescent girls in disaster recovery planning. Institutions risk perpetuating marginalization and failing to build community resilience by excluding this vulnerable yet capable demographic. Failure to include this demography may result in this risk. The paper also highlights adolescent-serving organizations' untapped potential. Korail's young women formed support networks, shared information, and solved problems creatively. Despite being overlooked in official planning, this resilience shows that adolescent females can prepare their communities as well as receive aid. This is true even when formal planning occasionally misses resilience. This agency can be identified and strengthened through participatory initiatives that bridge the gap between local community experiences and institutional interventions.

Considering these findings, some suggestions can be made. Climate education and awareness for adolescent girls should be a priority. This will ensure people know the risks and how to prepare. Second, safe areas should be built in the slum to provide emergency refuge and emotional support. Disaster management rules must be gender-sensitive and incorporate teens in decision-making. Partnerships between community organizations, NGOs, and government agencies can create a more complete and integrated resilience framework. In conclusion, the vulnerability of Korail slum teenage girls to climate change is a humanitarian concern and a test case for inclusive climate adaptation in urban South Asian communities. Policymakers can include these girls in climate change discussions by amplifying their perspectives, removing institutional barriers, and investing in structural and social resilience. This can be done by enhancing community social and structural resilience.

Recommendations

To improve climate resilience in Dhaka's Korail slum's female adolescents, several measures are suggested. These ideas aim to close education, infrastructure, health, and community participation gaps through gender sensitivity and inclusivity. Additionally, these recommendations are modified to close gaps.

1. Integrate Climate Education into School Curricula and Informal Learning Spaces

One of the most important outcomes of this study is that Korail adolescent females are unaware of climate change. So, they are vulnerable to shocks like flooding, fires, and excessive heat. Climate education must be integrated into formal and informal learning platforms to address this challenge. The national curriculum must include school-specific risk courses. This ensures that the knowledge gained applies to slum dwellers' lives. Community centers and informal learning spaces maintained by non-governmental organizations (NGOs) can help out-of-school teens learn about climate change. This education should emphasize actual preparedness measures that may be applied through interactive and participatory methods, not just abstract concepts. This may include role-playing, simulations, and storytelling. Mobile quizzes and text message notifications can reach even low-literate people. If given the knowledge, adolescent girls can defend themselves, help their families, and build resilient urban communities.

2. Develop Gender-Sensitive Disaster Response Infrastructure

The data indicate that disaster response mechanisms predominantly lack awareness of the gendered experiences of adolescent girls in slum environments. These girls are in danger of being harassed, having their privacy violated, and getting sick. To solve these problems, we need disaster response infrastructure that takes gender into account. Along with period hygiene supplies, clean water, and sanitation, there should be safe shelters with separate and secure areas for teenage girls. Emergency aid shipments should also include dignity kits made just for young women. Young girls need to be actively involved in disaster drills and evacuation planning, in addition to building physical infrastructure. This will make sure that their words are considered when planning responses. This will make things safer and give girls a chance to help make their communities stronger. These kinds of disaster management policy frameworks would make gender-responsive planning a part of the way things are done in urban slums.

3. Expand Community-Based Early Warning and Preparedness Systems

Another major gap in Korail is the lack of timely and accessible climate early warning systems. Adolescent girls are especially sensitive to climate change. Therefore, community-based early warning methods must be expanded and adapted to slum neighborhoods. Mobile text alerts, loud announcements, and neighborhood-level warning systems can reach underprivileged households with timely information at low cost. These strategies work in neighborhoods. In addition to early warnings, households should undergo disaster preparedness training. Adolescent girls should attend first aid, fire safety, evacuation planning, and water storage workshops. This will provide them with the skills and confidence to handle perilous circumstances. Youth-led resilience brigades, in which young women spread information and coordinate responses, can also improve local preparation. These programs can be integrated into community networks and national disaster management systems to bridge the gap between city-level authorities and slum populations.

4. Improve Access to Adolescent-Friendly Health and Counseling Services

This study underscores the physical and mental challenges adolescent girls face during climate emergencies, including heat-induced illnesses, aquatic infections, trauma, stress, and menstrual issues. The challenges include heat-induced and waterborne infections. However, Korail's health services remain inadequate, inaccessible, and unsuitable for teens and young adults. Adolescent-specific and gender-sensitive health interventions are needed to address this issue. Increasing mobile health clinics and creating community health centers in the slum would bring services closer to adolescents. Female health practitioners and trained counselors are needed to provide discreet, stigma-free reproductive and mental health care. Climate-health education in schools and non-governmental organizations can help females identify and manage climate-related health hazards. When adolescent health needs are neglected, early school dropouts, marriage, and exploitation often result. In addition to protecting teenagers' immediate well-being, these interventions prevent secondary effects. Adolescent-focused healthcare can be integrated into climate adaptation programs to provide a more comprehensive and long-term resilience framework.

5. Building Local Leadership Through Girl-Led Climate Clubs

The potential that female teenagers lead climate resistance can be the most transformational method. Korail girls' climate clubs can provide official platforms for young women to share knowledge, coordinate community initiatives, and advocate for their concerns. These groups can arrange street theater and storytelling as well as practical activities like rooftop gardening, garbage management, clean water initiatives, and awareness drives. Climate clubs can also connect NGOs, schools, and local government officials. This ensures teenage input into policy and planning. Mentoring models, in which older teens assist younger girls, can promote leadership and capacity building across generations. By expanding resilience programs through government-NGO partnerships, these clubs can alter the resilience narrative from externally imposed to community-owned. Empowering girls to lead climate action directly improves urban resilience and gender equality.

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Annex

Structured Questionnaire

Study Title: Assessing Climate Vulnerability and Resilience Among Urban Female Adolescents: A Study in Dhaka's Korail Slum

Consent Declaration

This survey is part of academic research. Your participation is voluntary, and all responses will be kept confidential. You may skip any question or stop at any time.

☐ I have read the information and agree to participate in this survey.

Section A: Demographic Profile

1. Age: _____

2. Educational Level:

☐ No Education ☐ Primary ☐ Secondary ☐ Higher Secondary

3. Currently Attending School?

☐ Yes ☐ No

4. Occupation (if any):

☐ Student ☐ Domestic Work ☐ Garment Worker ☐ Others: _____

5. Father's Occupation: _____

6. Mother's Occupation: _____

7. Household Monthly Income (approx.):

☐ Below 5,000 BDT ☐ 5,000–10,000 BDT ☐ 10,001–15,000 BDT ☐ 15,001–30,000 BDT ☐

Above 30,000 BDT

8. Type of Housing:

☐ Tin-shed ☐ Semi-permanent ☐ Makeshift/Shanty

9. Years Living in Korail Slum: _____

Section B: Exposure to Fire Incidents and Heat Stress

1. Have you experienced any fire incident in or near your home in the last 3 years?

☐ Yes ☐ No

2. If yes, how many times?

☐ Once ☐ 2–3 times ☐ More than 3 times

3. What were the impacts? (Tick all that apply)

☐ Loss of belongings ☐ Injury ☐ School absence/dropout ☐ Displacement ☐ Emotional trauma ☐ Other: _____

4. Have you felt extreme heat or discomfort during summer in recent years?

☐ Yes ☐ No

5. What issues have you faced due to heat? (Tick all that apply)

☐ Headache ☐ Dizziness/fainting ☐ Skin problems ☐ Lack of sleep ☐ School/work absence
☐ Mood swings/stress ☐ Others: _____

Section C: Knowledge and Perceptions of Climate Change

(1 = Strongly Disagree, 5 = Strongly Agree)

1. I believe the temperature in Dhaka has increased over recent years.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

2. Fires in slum areas have become more frequent.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

3. Climate change has made life harder for people like me.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral

- ☐ Disagree
- ☐ Strongly Disagree

4. I worry about my safety due to fire and heat hazards.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

5. Girls face more problems than boys during fire or heat events.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

6. Climate change has affected my ability to attend school or work.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

Section D: Source of Knowledge on Climate Change

1. Have you heard the term 'climate change'?

☐ Yes ☐ No

2. Where did you learn about climate change? (Tick all that apply)

☐ School ☐ TV/Radio ☐ Family/Friends ☐ NGO ☐ Government Program ☐ Internet/social media ☐ Others: _____

3. On a scale of 1–5, how would you rate your understanding of climate change?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section E: Resilience Capacities

(1 = Strongly Disagree, 5 = Strongly Agree)

Physical and Social Resilience

1. I know how to respond if a fire breaks out in my area.
 - ☐ Strongly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Strongly Disagree
2. My home has basic fire safety equipment or awareness.
 - ☐ Strongly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Strongly Disagree
3. I can protect myself during extreme heat.
 - ☐ Strongly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree
 - ☐ Strongly Disagree
4. I have access to shaded or cool places during heatwaves.
 - ☐ Strongly Agree
 - ☐ Agree
 - ☐ Neutral
 - ☐ Disagree

☐ Strongly Disagree

5. My family and neighbors help each other during emergencies.

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly Disagree

Economic and Institutional Resilience

6. My family can recover financially after a disaster.

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly Disagree

7. We have savings or support for emergencies.

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly Disagree

8. NGOs or governments help during fire or heat events.

☐ Strongly Agree

☐ Agree

☐ Neutral

- ☐ Disagree
- ☐ Strongly Disagree

9. I trust local institutions to help us during a disaster.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

10. Safety training programs have been provided in our area.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

Psychological and Emotional Resilience

11. I feel scared or anxious hearing about climate disasters.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

12. I find it hard to sleep or focus due to heat.

- ☐ Strongly Agree
- ☐ Agree

- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

13. I feel mentally affected after fire incidents.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

14. I talk to someone (friend/family) when I'm stressed about disasters.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

15. I feel mentally strong to deal with environmental problems.

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

Section F: Skills, Participation & Personal Preparedness

- ☐ 1. Have you ever participated in a training or program on climate change or disaster preparedness?
☐ Yes ☐ No

- 2. If yes, who organized it?
☐ School ☐ NGO ☐ Government ☐ Others: _____
- 3. On a scale of 1–5, how prepared do you feel to face a climate-related disaster?
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
- 4. What do you think is most important to become climate resilient? (Tick all that apply)
☐ Education ☐ Training ☐ Government support ☐ NGO involvement ☐ Community support ☐ Others: _____
- 5. Do you think girls like you have a role in making your community's climate resilient?
☐ Yes ☐ No ☐ Not Sure

Key Informant Interview (KII) Guide

Title: *Assessing Climate Vulnerability and Resilience Among Urban Female Adolescents: A Study in Dhaka's Korail Slum*

1. Can you tell us about your role in the Korail community?
2. How long have you been working in/with this community?
3. What types of climate-related events (e.g., fire, extreme heat) have affected this area in recent years?
4. How frequent are fire incidents in Korail?
5. How do high temperatures affect daily life here, especially for young people?
6. In your experience, how are adolescent girls specifically affected during fire incidents or heatwaves?
7. What challenges do they face in accessing safety, healthcare, or continuing education during such events?
8. How prepared is the community to respond to fire outbreaks or extreme heat?
9. Are there any early warning systems, emergency plans, or fire safety measures in place?
10. What kinds of coping strategies do adolescent girls or their families use?
11. What support is available from government or NGOs in such crises?
12. Have you been involved in any awareness or capacity-building programs focused on climate change, fire safety, or heat resilience?
13. What do you think should be done to improve resilience among adolescent girls in slum areas?
14. What roles can schools, families, and NGOs play to better protect them?

Focus Group Discussion (FGD) Guidelines

1. Can you tell us your name, age, and what you do (school, work, etc.)?
2. Have you heard of climate change? What do you think it means?
3. Do you feel that summer has become hotter in recent years?
4. Have you ever experienced a fire near your home?
5. Can you describe what happened during the last fire incident you witnessed?
6. How did you and your family respond during that situation?
7. What problems do you face during very hot days? (e.g., sleep, school, sickness)
8. Has your education or health been affected by these events?
9. What do you do to stay cool during hot weather?
10. Are you or your family prepared for fire incidents? (e.g., water buckets, exits)
11. Who do you turn to for help during emergencies?
12. Have any NGOs, schools, or others ever given you advice or training on how to stay safe from fires or extreme heat?
13. Do you know where to go if you need help after a disaster?
14. What kind of support or training would you like to receive?
15. What changes would make your community safer for girls like you?

Photo Collection from Study Area





