

Impact of environmental degradation on children and women in the slum areas of Agartala: A case study

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Abstract - Urbanisation in India has surged to new heights, with Tripura state exemplifying this trend, harbouring an urban population of 26.18% as per the 2011 census. This expansion, although a driver for economic opportunities, has simultaneously ushered in an array of socio-environmental challenges. Central to these is the plight of urban slum dwellers, particularly around Agartala's Haora River basin, where the proliferation of slums and the corresponding environmental degradation have raised serious health concerns, especially for women and children. This study delves into the slums adjacent to the Haora River, aiming to provide a detailed assessment of their physical environment and the multifaceted factors contributing to the river's deterioration. The paper places a special focus on the repercussions of environmental degradation for the most vulnerable groups within these locales: children and women. This paper examines the direct and indirect impacts of polluted waterways, inadequate sanitation facilities, and compromised natural habitats on the health and social welfare of these populations. The findings aim to offer insights into the complex interplay between urban poverty, environmental health, and societal wellbeing, ultimately informing policy and interventions designed to mitigate such issues and promote sustainable urban living conditions. The research not only contributes to the body of knowledge on urban environmental challenges but also calls for urgent action to address the plight of those most affected by the degradation of their surroundings.

Index Terms - Environmental degradation, urban slum, sanitation, social marginalisation, urban poverty

I. INTRODUCTION

India's urban landscape is undergoing a significant transformation characterized by an escalating trend of urbanisation, as highlighted by the 2011 census which reported that 31.16 per cent of the population resides in urban areas. This pattern is mirrored in the state of Tripura, where urbanisation has reached a substantial level with 26.18 per cent of its population living in urban settings, closely trailing the national average. However, this surge in urbanisation has not come without its drawbacks. As cities expand rapidly and unsystematically, with a glaring mismatch between the supply and upkeep of housing and infrastructure, urban centers are faced with profound challenges. These include, but are not limited to, escalating poverty rates, deepening inequality, and an array of health risks arising from environmental degradation. The adverse effects of urbanisation are most acute among the urban slum dwellers, who often lack basic protective infrastructure, face occupational hazards, and are generally unaware of the environmental threats they face. In Tripura, particularly around the capital city of Agartala, there has been a notable increase in the slum population over recent decades, with a significant concentration of these slums around the Haora River basin areas.

The physical characteristics in most of these slums are essentially the same. They are usually a cluster of hutments with dilapidated and infirm structures having common or no toilet facilities, suffering from lack of basic amenities, inadequate arrangement for drainage, and for disposal of solid wastes and garbage. These inadequacies make the living conditions in slums extremely suboptimal, unhygienic and results in usually higher incidence of air and water borne diseases for the dwellers [1]. And as the slums get crowded, the environment gets overpopulated and as a result, there is twice as much trash, corpses, and human excretion [2]. All these results in environmental degradation as well as poor health among the slum dwellers.

The most vulnerable to these harsh realities are the women and children of these communities. They bear the disproportionate impact of the adverse health outcomes resulting from the environmental decline. This research aims to delve into the environmental conditions of the slum areas adjacent to the Howrah River, identify the contributing factors to the river's degradation, and analyse the consequential effects on the health and well-being of the women and children residing in these communities

II. LITERATURE REVIEW

In their research 'An Observation on the deterioration of a channel: A case study from Agartala city, Tripura, North-east India', **Nibedita Das and Sukumar Das** [3] investigated the degradation of water quality in the Kata Khal channel, examining land use changes over a period of 73 years, from 1932-33 to 2005, using Remote Sensing techniques. The study attributed the channel's pollution to the disposal of a variety of domestic wastes, the solid and sewage waste from markets, and effluents from several drains managed by the Agartala Municipal Council (AMC), in addition to the outflow from four significant sluice gates in the capital city. The core issue was identified as the mounting population pressure within the Agartala Municipal Area. Moreover, the study revealed that the channel's excessively contaminated waters have turned into fertile breeding grounds for mosquitoes, flies, and other insects, leading to a surge in disease incidence such as dysentery, cholera, jaundice, malaria, skin conditions, and urinary and fecal infections in recent times.

Christian Zurbrügg [4] in his article 'Solid Waste Management in Low-Income Countries of Asia How to Cope with the Garbage Crisis' highlights the importance of proper solid waste management for ensuring healthy living conditions and the risks associated with inadequate waste disposal. The author highlights some key points and suggestions on how to cope with the garbage crisis in low-income countries of Asia like focusing on the importance of Solid Waste Management, identifying the challenges in Low-Income

Countries, impact on Urban Poor and Rapid Urbanisation, awareness of elements of Solid Waste Management Systems, Waste Generation and Composition, and identifying the Institutional Challenges of Public-Private Partnerships (PPP), Local Private Sector and Community-Based Organizations.

Leke Oduwaye and Taibat Lawanson [5] in their article 'Poverty and environmental degradation in the Lagos metropolis' discusses the environmental problems facing the Lagos Metropolis in Nigeria. The problems are categorized into physical, sociological, and management issues. The paper highlights the connection between poverty and environmental degradation and examines the causes and consequences of these problems. It emphasizes the role of the urban poor in contributing to these issues and their vulnerability to their consequences. The Lagos Metropolis is found to be far from achieving the targets of the Millennium Development Goals (MDGs). The paper concludes by advocating for good urban governance as a strategy to achieve a sustainable Lagos Mega-city and meet the MDG targets.

In the article 'Improving sanitation in poor urban settlements exploring the option of community led sanitation approach in Ashaiman municipality, Ghana,' **Abena Korang Acheampong [6]** examines the subpar sanitation conditions within Ashaiman, a municipal area in Ghana. The article advocates for a Community-Led Sanitation Approach as a potential remedy, proposing the involvement of the community in surmounting sanitation obstacles through the empowerment of key local actors, including civil society organizations, NGOs, and informal private service entities. The study furnishes a comprehensive profile of the municipality, encompassing demographic and health statistics, economic traits, and insights into the availability of fundamental services and infrastructure. It also delves into aspects of education, housing policy, land utilization, quality of shelter, as well as safety and comfort. The importance of enduring, sustainable sanitation solutions is stressed, with particular attention to the contribution of the Institute of Local Government Studies in advocating for shelter development initiatives.

Fiasorgbor A. Doris [7] in his article 'Water and Sanitation Challenges of Slum Dwellers in Ghana: The Case of Nima Women' examines urban poverty and its implications for environmental health, the case study of Nima, a densely populated settlement in Accra, stands out. The study highlights the distressing state of water and sanitation practices, particularly among women. The scarcity of social amenities forces residents to allocate a considerable portion of their time to obtaining basic services like water, which could otherwise be used productively. This scarcity is compounded by ingrained behaviors that contribute to environmental degradation and elevate the susceptibility of the community to health issues. Furthermore, the study also stresses on the importance of community education, advocating for targeted programs that deter residents, particularly women and children, from disposing of human waste inappropriately in refuse bins and gutters, a practice that exacerbates health risks.

In developing countries, the issue of providing adequate shelter extends beyond mere infrastructure challenges; it directly impacts vulnerable populations, particularly women and children. For more than a quarter of a century, national and municipal governments have grappled with this fundamental problem [8]. The term 'slum' is often employed to describe housing that fails to meet basic standards, reflecting a dire need for improved living conditions to support human development [9]. Within these urban environments, women and children are disproportionately affected, facing heightened risks of exploitation, abuse, and inadequate access to essential services. Addressing the housing crisis is not only a matter of infrastructure but also a crucial step towards safeguarding the rights and well-being of marginalised communities, including women and children, in developing cities.

III. BACKGROUND OF THE STUDY AREA

Haora or Howrah River which originates from the eastern side of the Baramura ranges in Central Tripura flows westerly through the alluvial plains and passes by the southern embankment of the capital city of Agartala before finally flowing down into Bangladesh. It is one of the ten major rivers of Tripura and it is the lifeline of Agartala city as the majority of the city dwellers are dependent on the river for their drinking water and other activities. The Haora River, originating from Baramura Hill, is subject to various forms of human activity along its course, which is categorized into four significant segments based on the nature and impact of these interventions. The initial stretch from the origin to Champaknagar comprises the river's upper catchment, now markedly deforested, posing a threat to the river's future as a water resource. The section from Champaknagar to Jirania is marked by an abundance of brick kilns that heavily sediment the river, exploit its water, and pollute it with various effluents. Between Jirania and Chandrapur, the river suffers from unregulated sediment removal, altering its gradient and leading to its decline. This segment is further burdened by industrial activities, major transit hubs, and commercial centers, with Chandrapur signifying the onset of significant slum developments along the riverbank. The final segment, from Chandrapur to the Bangladesh border, is the most crucial in this context, as it is the study area of concern. Here, the river is flanked by a dense array of slums, major hotels, restaurants, and markets. Excessive waste from these settlements and businesses, including industrial and toxic substances, is disposed of directly into the river. Additionally, the river is subjected to further pollution from numerous immersion and cremation sites, along with agricultural runoff. Notably, this part also exhibits man-made alterations to the river's natural course [10].

It is within this final segment that the study area lies, and it is pertinent to acknowledge the swift expansion of the slum population in Tripura. This growth has been fueled by rapid urbanization, rural-urban migration, and notably, immigration from Bangladesh. A significant number of these immigrants have established their homes along the banks of the Haora River in Agartala. For the purposes of this study, two major slum areas have been selected: the Battala slum area and the Pratapghar slum area. These sites will provide a focused lens on the impact of environmental degradation on women and children residing in slum conditions.

IV. OBJECTIVES OF THE STUDY

- To assess the physical environment within the slum-concentrated areas located alongside Howrah River.
- To identify the factors contributing to the degradation of the Howrah river.
- To analyse the impact of environmental degradation on the well-being of children and women residing in the chosen slum communities.

V. METHODOLOGY

This pilot study primarily focuses on specific slum areas situated near the banks of the Howrah River in Agartala. Two major slum areas, namely Battala slum area and Pratapghar slum area, were purposively selected. A total of 60 households were randomly chosen as the study participants, with 75 women responding to surveys, and 25 children being observed as part of this study.

VI. FINDINGS AND DISCUSSIONS

Sanitation and drainage:

Sanitation is undeniably a vital service for human well-being. According to the 2011 Census, Battala and Pratapghar slum areas lacked an established sanitation and drainage system. However, during the field study, it became evident that the government had provided toilets in some cases, and certain residents even had private toilets within their households.

Likewise, there were three types of drains observed in the field areas: deep drains, semi-deep drains, and small kaccha drains. Despite the presence of these facilities, the study uncovered persistent and severe sanitation and drainage issues in the Battala and Pratapghar slum areas. Most slum dwellers relied on public toilets which were poorly maintained and mostly dirty due to inadequate funding for maintenance and deficient management of existing toilet facilities.

Furthermore, open defecation was a common practice in open spaces, water bodies, and drains, exacerbated by the absence of pit latrines with slabs. Consequently, both human waste and domestic sewage were directly discharged into the river. As a result, sanitation and drainage conditions in all surveyed slums were generally substandard.

Reasons for degradation of River Haora:

The study reveals that the slum dwellers of the river bank use kaccha latrines and so their excreta flow directly into the river. Due to this, the river water quality has deteriorated to an alarming condition. Moreover, the drainage is also directly connected with the river. Therefore, even the untreated sewerage and drainage dumps are directly dumped into the river, resulting in environmental degradation. And this has posed a threat to the health of the population especially the women and children.

Haora river is a non-perennial river and is prone to flood during the rainy season. Therefore, whenever there is high intensity of rainfall, the volume of water cannot be accommodated within the river banks leading to flooding of the low-lying areas. The flood during the rainy season also results in river bank erosion which in turn not only affects the lives of the slum dweller but also degrades the river water.

Impact of environmental degradation on children and women:

Proper housing is an important factor for both social as well as psychological development of children. But, the study reveals that the slum dwellers have a dreadful life with poor lighting, ventilation, high crowding and living. Most of the household have seven to nine family members and most of them hold a single room for the whole family which makes the slums very congested. And in some cases, it is found that two to three families stay together in one single room where they live as well as cook in the same room. The houses are not only over-crowded but lack privacy which later creates problems for the parents in controlling their children. Moreover, the family size is so large that a mother is not able to give as much attention to the minor ailments of each child which leads to poor health.

Most slum dwellers were relying on poorly maintained community toilets which sometimes caused disputes among the slum dwellers and at the same time created an unhygienic environment. Also most frequently, people defecate in pits or in the open or in ditches, drains, or rivers creating an unhygienic environmental condition which have led to many diseases such as typhoid fever, diarrhea, cholera, malaria, skin problems especially among children and women as they spend most of the time at home.

It was observed that not only the areas are densely populated, but also have problems with open sewage systems and a lack of private toilet facilities. Even in cases where community toilets exist, they are often poorly maintained, leading residents to resort to open defecation as a result.

Most of the households either do not have individual household bathrooms or have no roof in the bathroom which becomes a security threat for the children and the women. They also face harassment and abuse while using open defecation as well as while they directly take bath in the river.

It is also noticed that the slum dweller uses the river water for washing, bathing, cooking and even drinking as they have limited access to drinking water supply. Moreover, the drinking water supply is equally degraded which has a definite impact on the incidence and spread of diseases.

Most of the respondents residing in slum areas are migrants or predominantly from lower socioeconomic backgrounds. These respondents are drawn to the central areas of Agartala city, where they seek proximity to their places of employment, thereby playing a substantial role in the city's economic functioning. However, the living conditions in these slum areas are often unsanitary, posing significant health risks to residents. Particularly during the rainy season, when many slums are situated in low-lying areas near to riverside, inhabitants become more vulnerable to illnesses due to inadequate drainage and sanitation infrastructure.

In environments where there is a scarcity of water, inadequate sanitation, insufficient drainage, substandard housing, and poor waste collection services, crowded living conditions become fertile grounds for the proliferation of disease-causing parasites and vectors. Within this context, slum areas have been recognised as significant sources of waste generation, leading to substantial environmental deterioration and the spread of various illnesses [11]. The repercussions of these conditions disproportionately impact women and children, who suffer adverse consequences not only physically but also mentally and emotionally.

VII. CONCLUSION AND RECOMMENDATIONS

Access to water and sanitation is crucial for sustaining life and maintaining human dignity. However, residents of slum areas are often deprived of these essential services, leading to a cycle of environmental decay, social marginalization, and deteriorating health conditions [12].

The Haora River, flowing through Agartala, is a stark example of this issue. It has become heavily contaminated with human waste, untreated sewage, and trash, rendering its water unfit for drinking, bathing, or any domestic purpose. This severe pollution is largely attributed to the lack of adequate social amenities in the slum areas situated along the riverbanks. Moreover, the detrimental habits adopted by the inhabitants of these slums exacerbate environmental damage and heighten their susceptibility to health problems and other social challenges.

To preserve the Haora River and ensure its utility for future generations, urgent conservation measures are necessary. The government should implement comprehensive strategies to improve the river's condition. Initiatives should include clearing and maintaining the riverbanks to prevent further pollution, and promptly managing sewage disposal to halt the influx of waste into the river. Additionally, there is a critical need to foster awareness among the slum population, particularly targeting women and children, about health and sanitation practices. Educating these communities about the consequences of disposing of waste in the river and encouraging better waste management practices are fundamental steps. These actions will not only safeguard the river from further degradation but will also significantly enhance the living conditions of the slum dwellers, creating a healthier and more sustainable environment for all.

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