



Major Current Environmental Problems in Bangladesh: Causes, Implications, and Citizen Solutions

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Abstract: Bangladesh faces significant environmental challenges stemming from rapid industrialization, urbanization, and climate change impacts. This article examines the major environmental problems plaguing the nation, focusing on their causes, implications, and potential citizen-driven solutions. Key issues include air and water pollution exacerbated by industrial emissions and inadequate waste management systems. Rapid deforestation, driven by urban expansion and agricultural practices, threatens biodiversity and exacerbates soil erosion. The implications of these environmental problems are profound, affecting public health, food security, and socioeconomic stability. Vulnerable populations, particularly in low-lying coastal areas, face increased risks from climate-induced disasters like cyclones and flooding. Moreover, contamination of water sources with pollutants poses severe health risks, contributing to the prevalence of waterborne diseases. Addressing these challenges requires collaborative efforts involving government policies, private sector initiatives, and active citizen participation. Promoting sustainable practices, such as renewable energy adoption and efficient waste management, can mitigate environmental degradation. Additionally, empowering communities through education and awareness campaigns enhances resilience and fosters grassroots solutions. By analyzing the causes, understanding their implications, and exploring citizen-led interventions, this article provides a comprehensive overview of Bangladesh's environmental landscape and underscores the urgency of proactive measures to achieve sustainable development.

Keywords: Causes; Citizen Solutions; Environmental; Implications

Introduction

Bangladesh, a low-lying and densely populated country in South Asia, faces numerous environmental challenges that threaten its ecosystems, public health, and sustainable development (Das et al., 2024; Mojid, 2020). Despite the government's efforts to address these issues, the country continues to grapple with pressing environmental problems. In this essay, we will identify and discuss the major current environmental problems in Bangladesh, exploring the underlying causes and implications of these issues. Additionally, we will outline the role of a good citizen in solving and mitigating these environmental challenges. Bangladesh, a densely populated South Asian nation, confronts formidable environmental challenges exacerbated by

rapid industrialization and climate change. As one of the most vulnerable countries to climate impacts, Bangladesh grapples with a multitude of environmental issues that jeopardize public health, economic stability, and ecological balance (Jahedi et al., 2024). This introduction delves into the primary environmental problems plaguing the country, exploring their underlying causes, far-reaching implications, and potential solutions driven by citizen action.

From widespread air and water pollution stemming from industrial emissions and inadequate waste management to deforestation and biodiversity loss due to urban expansion and agricultural practices, each issue underscores the intricate interplay between human activities and environmental degradation (Kolawole & Iyiola, 2023). Moreover, Bangladesh's

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susceptibility to climate-induced disasters, such as cyclones and flooding, exacerbates these challenges, particularly affecting marginalized communities (Zaman et al., 2025). Amid these pressing concerns, citizen engagement emerges as a critical force for fostering sustainable practices and resilience-building initiatives. By examining these issues holistically, this article aims to illuminate pathways toward environmental sustainability in Bangladesh through informed policy, collective action, and community empowerment.

This article aims to achieve a comprehensive understanding of the major environmental problems in Bangladesh, focusing on three main objectives: firstly, to identify and analyze the primary causes of environmental degradation, including industrial pollution, deforestation, and climate change impacts. Secondly, to explore the far-reaching implications of these environmental issues on public health, socioeconomic stability, and ecological balance, particularly in vulnerable communities. Thirdly, to investigate citizen-driven solutions and initiatives that contribute to mitigating environmental degradation and enhancing resilience. By fulfilling these objectives, the research seeks to provide valuable insights into the complex interplay between human activities and environmental challenges in Bangladesh, emphasizing the role of citizen participation in promoting sustainable development practices and fostering environmental stewardship.

Through a multidimensional approach that integrates scientific analysis with social and economic perspectives, this study aims to inform policymakers, researchers, and the public about effective strategies for addressing current environmental issues and building a more sustainable future for Bangladesh. This study aims to achieve a comprehensive understanding of the major environmental challenges facing Bangladesh, focusing on three primary objectives: Identifying Causes: Investigating the root causes behind key environmental issues such as air and water pollution, deforestation, and climate vulnerabilities exacerbated by rapid industrialization and urban expansion; Assessing Implications: Analyzing the socioeconomic, health, and ecological implications of these environmental problems on Bangladesh's population, particularly vulnerable communities in coastal and urban areas; Exploring Citizen Solutions: Exploring effective citizen-driven initiatives and community-based solutions aimed at mitigating environmental degradation and enhancing resilience.

This includes examining the role of grassroots organizations, community awareness campaigns, and innovative practices in promoting sustainable development. By addressing these objectives, this

research seeks to inform policy-makers, stakeholders, and the general public about the urgency of environmental conservation in Bangladesh. It aims to advocate for evidence-based interventions and empower communities to actively participate in safeguarding the country's natural resources and fostering a sustainable future.

Method

Online Research: Online research involves using the internet to gather information and data for your research project (Gaiser & Schreiner, 2009). It includes collecting data from websites, databases, online publications, and various digital sources. I used search engines, academic databases, and various online tools. I reviewed existing online sources, academic articles, and relevant websites to gather background information.

Steps

Identify research objectives and questions; Use search engines and databases to find relevant sources; Evaluate the credibility and reliability of online sources; Extract and compile data from websites, articles, or digital resources; Analyze and synthesize the gathered information for your research.

Surveys

Surveys are a structured data collection method where researchers design questionnaires or interviews to gather information from a sample of respondents. Surveys can be conducted through various mediums, including paper, online forms, or in-person interviews. Steps: Define research objectives and formulate clear research questions; Design a survey instrument, including questions and response options; Determine the survey sample and method of distribution (e.g., online, phone, in-person); Administer the survey to respondents; Collect and analyze the data to draw conclusions and insights.

Designing the Survey

I designed a structured set of questions that are administered to a group of respondents via Google Form. The question was open-ended, closed-ended, and a mix of both: Sampling: I selected a representative sample of the target population. This was done through random sampling; Data Collection: The data of this survey was collected from the respondents based on the survey design via Google Form and Phonic Conversation.

Data Analysis

The collected data was analyzed using statistical methods to draw conclusions and insights. Ethical

Considerations: I obtained the information and data through informed consent, ensured confidentiality, and handle data in compliance with relevant ethical and legal standards.

Phonic Conversation

Phonic conversations, or phone conversations, are verbal interactions with participants conducted over the phone. This method is often used in qualitative research to collect in-depth information through interviews or discussions.

Steps

Establish research objectives and design a conversation guide or interview script; Identify and select participants (interviewees) who fit the research criteria; Schedule and conduct phone interviews, following the guide; Record the conversations (with consent) or take detailed notes; Transcribe and analyze the data for patterns and insights.

Participant Selection

I identified individuals and groups to engage in phone conversations. These participants was chosen based on specific criteria and as a random sample; Script or Protocol: I prepared a script or a set of questions to guide the conversation. This can included both open-ended and closed-ended questions; Conducting the Conversation: I was engaged in phone conversations with participants, asking questions and recording responses.

Data Analysis

The recorded conversations were transcribed, and the data was analyzed to identify patterns, themes, and insights.

Ethical Considerations

I obtained the information and data through informed consent, ensured privacy and confidentiality, and followed ethical guidelines during the conversations.

Literature Review

A literature review is a comprehensive summary and analysis of the existing research on a particular topic. It identifies key themes, debates, and gaps in the literature, and provides a context for new research. Its main purposes are to provide an overview of what is already known, to identify patterns and trends, to highlight areas where knowledge is lacking, and to establish a theoretical foundation for further research.

The process of conducting a literature review involves several steps: Identifying Research Questions and Objectives: I began by clearly defining the purpose

of literature review. Ask what specific questions are trying to answer or what objectives are aimed to achieve. This helps to stay focused and guide search for relevant literature. It defines the research questions and objectives; Searching for Relevant Literature: I used a variety of sources to gather relevant literature, including academic databases (e.g., PubMed, JSTOR, Google Scholar), library catalogs, and reference lists from relevant articles. Employ search strategies like keyword searches, Boolean operators (AND, OR, NOT), and filtering by date or type of publication to narrow down the search results (Aromataris & Riitano, 2014). Make sure to include seminal works and recent studies to get a comprehensive view of the topic. Searched through databases and other sources for relevant literature using keywords and filters; screening and Selecting Sources: Once having a list of potential sources, I evaluated each one for its relevance and quality. Look at the abstract, introduction, and conclusion to determine if the source is pertinent to the research question. Assess the credibility of the authors and the publication, and ensure the methodology and findings are sound. Exclude sources that are outdated, irrelevant, or of low quality.

Evaluate and select high-quality, relevant sources from your search results; Organizing the Literature: I Organized selected sources into categories based on themes, theories, methodologies, or chronological order. This can help to identify patterns, trends, and gaps in the research. Use reference management tools like EndNote, Zotero, or Mendeley to keep track of the sources and format citations properly. Create an outline to structure the review logically. Categorize the sources and use reference management tools to organize them; Analyzing and Synthesizing the Literature: I critically analyze the content of the selected sources. Compare and contrast the findings, methodologies, and theoretical frameworks. Identify key themes, debates, and gaps in the literature. Synthesize the information by integrating the insights from different studies, highlighting how they contribute to the understanding of the research question. Look for consensus and disagreements among researchers. Critically evaluate and integrate findings from the sources; Writing the Literature Review: I structured the literature review into three main sections: introduction, body, and conclusion. In the introduction, provide an overview of the topic and state the purpose of the review. In the body, discuss the literature in organized themes or categories, presenting a critical analysis and synthesis of the findings.

Use subheadings for clarity. In the conclusion, I summarized the key findings, highlight gaps in the research, and suggest areas for future study. Ensure that writing is clear, concise, and free of jargon. Write the literature review with a structured introduction, body, and conclusion; Revising and Editing: After completing

the draft of the literature review, I took time to revise and edit it. Checked for clarity, coherence, and logical flow. Ensured that the arguments are well-supported by the literature. Looked for grammatical errors, typos, and proper citation of sources.

Considered getting feedback from peers or advisors to improve the quality of the review. Making sure it adheres to the required formatting and style guidelines. Revise and edit the literature review for clarity, coherence, and correctness. A literature review is a critical appraisal of existing research that helps to build a foundation for new research projects. It demonstrates the researcher's knowledge of the field, identifies where further research is needed, and situates new research within the context of existing knowledge.

Result and Discussion

Major Current Problems Faced by people in Bangladesh: Causes, Implications, and Citizen Solutions:

Water Pollution

Causes

Water pollution in Bangladesh is primarily caused by industrial waste, untreated sewage, and agricultural runoff (Tariq & Mushtaq, 2023). Rapid industrialization and urbanization have led to the discharge of toxic chemicals, heavy metals, and organic pollutants into water bodies.

Implications

Water pollution poses a severe threat to public health, as contaminated water sources are responsible for waterborne diseases like cholera and dysentery (Ali et al., 2021). Moreover, it harms aquatic ecosystems, disrupts the food chain, and depletes biodiversity. The pollution of rivers and wetlands also affects agriculture and fishing, impacting the livelihoods of millions of people.

Citizen Solutions

As a good citizen, people can contribute to solving water pollution by practicing responsible waste disposal and promoting recycling (Yang et al., 2018). Participate in community clean-up drives near water bodies and advocate for the enforcement of environmental regulations on industries. Support and volunteer with organizations working on water quality monitoring and water conservation projects.

Air Pollution

Causes

Air pollution in Bangladesh is mainly caused by vehicular emissions, industrial activities, brick kilns, and burning of biomass and waste (Khandker et al., 2023).

The high population density and rapid urbanization exacerbate the problem.

Implications

Air pollution leads to respiratory illnesses, cardiovascular diseases, and other health problems, especially in urban areas (Shahriyari et al., 2022). It also damages buildings, monuments, and vegetation, and contributes to climate change by releasing greenhouse gases.

Citizen Solutions

As a responsible citizen, people can help reduce air pollution by using public transportation, carpooling, or cycling instead of driving alone. Support the use of cleaner fuels and advocate for the implementation of emission standards for vehicles and industries. Plant trees and support afforestation initiatives to improve air quality.

Deforestation

Causes

Deforestation in Bangladesh is primarily driven by logging for timber, expansion of agricultural land, and urbanization. The demand for firewood and charcoal also contributes to forest degradation.

Implications

Deforestation leads to the loss of biodiversity, soil erosion, and disruption of ecosystems. It contributes to climate change by reducing the capacity of forests to sequester carbon dioxide. Moreover, deforestation reduces natural habitat for wildlife and threatens endangered species.

Citizen Solutions

As a good citizen, people can support reforestation and afforestation efforts by participating in tree-planting campaigns and promoting sustainable land use practices. Use alternative cooking fuels to reduce the demand for firewood and support community-led sustainable forestry initiatives.

Land Degradation

Causes:

Land degradation in Bangladesh is caused by inappropriate land use practices, overgrazing, and soil erosion due to deforestation and agricultural activities.

Implications

Land degradation reduces agricultural productivity, leading to food insecurity and economic losses. It also exacerbates the effects of natural disasters, such as floods and landslides, further impacting communities and infrastructure.

Citizen Solutions

As a responsible citizen, people can promote soil conservation practices such as terracing and agroforestry. Support sustainable farming techniques and encourage the use of organic fertilizers to reduce soil degradation. Participate in community-led land restoration projects and advocate for the protection of natural habitats.

*Loss of Biodiversity**Causes*

The loss of biodiversity in Bangladesh is mainly attributed to habitat destruction, deforestation, pollution, and overexploitation of natural resources.

Implications

The loss of biodiversity leads to the extinction of plant and animal species, disrupting ecological balance and reducing ecosystem services. It impacts agriculture, fisheries, and medicine, affecting human well-being and livelihoods.

Citizen Solutions

As a good citizen, people can support biodiversity conservation by participating in wildlife protection initiatives and supporting the establishment of protected areas. Avoid purchasing products made from endangered species or illegal wildlife trade. Promote eco-tourism and responsible wildlife viewing to raise awareness about the importance of biodiversity.

*Climate Change Vulnerability**Causes*

Bangladesh is one of the most vulnerable countries to the effects of climate change due to its low-lying geography and proximity to the sea. The major causes of climate change are global greenhouse gas emissions and deforestation.

Implications

Climate change poses significant risks to Bangladesh, including sea-level rise, increased frequency of cyclones, and changes in precipitation patterns. These impacts lead to coastal erosion, submergence of land, loss of agriculture, and displacement of communities.

Citizen Solutions

As a responsible citizen, people can support climate resilience by adopting eco-friendly practices and reducing your carbon footprint. Advocate for renewable energy sources and support climate change adaptation projects that benefit vulnerable communities.

*Solid Waste Management**Causes*

Rapid urbanization and population growth have led to an increase in solid waste generation in Bangladesh. Inadequate waste management infrastructure and lack of public awareness contribute to the problem.

Implications

Improper solid waste management leads to the accumulation of waste in public spaces, rivers, and water bodies, causing environmental pollution and health hazards. The burning of waste releases harmful toxins and greenhouse gases into the atmosphere.

Citizen Solutions

As a good citizen, people can contribute to effective waste management by practicing waste segregation at the source and promoting recycling and composting. Participate in community-led waste management initiatives and advocate for improved waste collection and disposal systems.

*Water Scarcity**Causes*

Water scarcity in Bangladesh is caused by over-extraction of groundwater for irrigation and domestic use, pollution of water sources, and changes in precipitation patterns due to climate change.

Implications

Water scarcity affects agriculture, industries, and public health. It leads to reduced crop yields, increased competition for water resources, and migration of communities in search of water.

Citizen Solutions

As a responsible citizen, people can promote water conservation by adopting water-saving practices at home and in agriculture. Support rainwater harvesting projects and advocate for sustainable water management policies.

*Coastal Erosion and Sea-Level Rise**Causes:*

Coastal erosion in Bangladesh is primarily due to rising sea levels, human activities, and the reduction of sediment supply from upstream.

Implications

Coastal erosion threatens infrastructure, agriculture, and communities, leading to land loss and displacement. Rising sea levels exacerbate the impacts of cyclones and flooding, increasing vulnerability to natural disasters.

Citizen Solutions

As a good citizen, people can support coastal protection efforts by participating in beach clean-ups and supporting coastal afforestation projects. Advocate for sustainable coastal development and the implementation of climate change adaptation measures in vulnerable areas.

Air and Noise Pollution

Causes

Air and noise pollution in urban areas of Bangladesh are primarily caused by vehicular emissions, industrial activities, and construction work.

Implications

Air pollution in urban areas leads to respiratory illnesses and other health problems. Noise pollution affects mental well-being, disrupts sleep patterns, and affects productivity.

Citizen Solutions

As a responsible citizen, people can support cleaner transportation options, such as electric vehicles, and advocate for green building practices to reduce air and noise pollution. Engage in community-led initiatives that promote greener and quieter urban environments.

Analytical Discussion

The environmental landscape of Bangladesh presents a multifaceted challenge characterized by a convergence of industrial growth, urbanization pressures, and climate vulnerabilities. The causes of these environmental problems are deeply rooted in rapid industrialization leading to air and water pollution, exacerbated by inadequate waste management systems. Deforestation driven by urban expansion and agricultural practices further strains ecosystems and exacerbates soil erosion, threatening biodiversity. The implications of these environmental issues are profound and widespread, impacting public health through increased incidences of waterborne diseases and respiratory ailments. Socioeconomic stability is also at risk, particularly in low-lying coastal regions vulnerable to cyclones and flooding exacerbated by climate change.

These challenges disproportionately affect marginalized communities, highlighting the intersectionality of environmental and social justice issues. Citizen-driven solutions offer a promising avenue for addressing these complex problems. Grassroots initiatives promoting sustainable practices, such as community-based waste management and renewable energy adoption, showcase the potential for local engagement in environmental stewardship. Education and awareness campaigns empower

communities to advocate for policy reforms and resilience-building measures. Addressing Bangladesh's environmental challenges necessitates integrated approaches that blend scientific research, policy innovation, and community empowerment. By fostering collaboration between stakeholders and leveraging citizen participation, sustainable solutions can be developed to mitigate environmental degradation and promote a resilient future for all Bangladeshis.

Conclusion

Bangladesh faces formidable environmental challenges driven by rapid industrialization, urbanization, and climate change impacts. The causes of these problems, including industrial pollution, deforestation, and inadequate waste management, have far-reaching implications for public health, socioeconomic stability, and ecological balance. Vulnerable populations bear the brunt of these impacts, exacerbating inequalities and threatening livelihoods. However, amidst these challenges, citizen-driven solutions emerge as pivotal in fostering sustainable development. Local initiatives promoting renewable energy, efficient waste management, and community resilience underscore the transformative potential of grassroots action. Education and awareness campaigns play a crucial role in empowering communities to advocate for environmental policies and practices that prioritize sustainability and resilience. Moving forward, addressing Bangladesh's environmental issues requires concerted efforts from government, private sector, and civil society stakeholders. Integrated strategies that combine scientific research with community engagement can pave the way for a more sustainable future. By harnessing collective action and promoting inclusive policies, Bangladesh can mitigate environmental degradation, enhance resilience to climate impacts, and safeguard the well-being of its people and ecosystems for generations to come.

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Author Contributions

Conceptualization,; methodology, validation,; formal analysis,; investigation,; resources, data curation,; writing—original draft preparation,; writing—review and editing, ; visualization, R. A. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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