

## Climate Change Mitigation: Bangladeshi Citizen's Engagement and Responsibility

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### ABSTRACT

**Introduction:** Climate change is a burning global issue affecting all countries in varying intensities, and countries like Bangladesh suffer various direct and indirect impacts that pose a long-term risk to the nation's environmental sectors. The country is frequently hit by natural disasters such as floods, cyclones, and droughts, which are increasing in frequency and intensity due to climate change. In this context, citizen engagement and responsibility play a vital role in promoting sustainable practices and building resilience to the effects of climate change. It discusses various initiatives undertaken by the government and non-governmental organizations to promote citizen engagement and education, and emphasizes the importance of civil society organizations in promoting climate change mitigation efforts. This article calls for increased citizen engagement and responsibility in reducing greenhouse gas emissions and building resilience to the effects of climate change. Overall, the article serves as a valuable resource for policymakers, researchers, and practitioners interested in promoting citizen engagement in climate change mitigation efforts.

**Methods:** The purpose of this review was to provide a comprehensive overview of "Climate Change Mitigation: Bangladeshi Citizen's Engagement and Responsibility" based on open access articles. We identified relevant keywords and search terms and conducted a literature search on open access databases like PubMed Central, Scopus. A range of open access articles, including research papers, review articles, and other publications related to the topic were collected. Each article was critically evaluated, taking into consideration factors such as the quality of the research, the credibility of the authors, and the impact of the publication.

**Results:** Bangladesh is facing multiple climate-related challenges, including sea-level rise, increased frequency and intensity of cyclones and floods, droughts, and extreme heat. Mitigation measures, such as investing in renewable energy, promoting energy efficiency, promoting sustainable transportation, and reducing deforestation, are crucial in limiting the impacts of climate change. Citizen engagement is also essential, and individuals can contribute to mitigation efforts by reducing energy consumption, using public transportation or carpooling, reducing waste, and promoting sustainable practices. Building resilience through investments in early warning systems, infrastructure, and contingency plans for disasters is also important. The government and NGOs can take steps to mitigate climate change, including developing policies and regulations, promoting sustainable practices, providing training and resources, and advocating for policies and regulations.

**Conclusion:** Climate change is a global issue that affects Bangladesh severely. To mitigate its effects, Bangladeshi citizens can engage in efforts to reduce greenhouse gas emissions, promote sustainable practices, and adapt to the changing climate. However, climate change mitigation requires collective action beyond individual efforts, and the government and international community must take significant steps to reduce emissions and support vulnerable communities.

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### Introduction

Climate change is a global challenge that poses significant threats

to the environment, economy, and human well-being. Bangladesh is one of the country's most vulnerable to the effects of climate change, with a population of over 160 million people living in a low-lying delta region prone to frequent natural disasters such as floods, cyclones, and droughts [1]. The impacts of climate

change are already evident in Bangladesh, where rising sea levels, increased temperatures, and changes in precipitation patterns have led to food and water insecurity, displacement of populations, and loss of life and property [2].

In response to these challenges, the Bangladeshi government and non-governmental organizations have undertaken various initiatives to mitigate the effects of climate change. These initiatives aim to reduce greenhouse gas emissions and increase the resilience of vulnerable communities to the impacts of climate change. However, achieving these goals requires the active involvement and support of local communities. Citizen engagement and responsibility are crucial in promoting sustainable practices and building resilience to the effects of climate change [1,3,4].

This article discusses the role of Bangladeshi citizens in climate change mitigation efforts. It highlights several initiatives undertaken by the government and non-governmental organizations to promote citizen engagement and responsibility in reducing greenhouse gas emissions and building resilience to the effects of climate change. These initiatives include the development of climate-smart villages, education programs, and civil society organization activities.

The publication emphasizes the importance of citizen participation in the success of climate change mitigation initiatives, as they require the active involvement and support of local communities. It also highlights the crucial role of education in raising awareness about climate change and promoting sustainable practices. This article emphasizes the importance of civil society organizations in promoting citizen engagement and responsibility.

This article serves as a valuable resource for policymakers, researchers, and practitioners interested in promoting citizen engagement and responsibility in climate change mitigation efforts in Bangladesh and beyond. It calls for increased citizen engagement and responsibility in promoting sustainable practices, reducing greenhouse gas emissions, and building resilience to the effects of climate change.

### Methodology

The purpose of this review was to provide a comprehensive overview of "Climate Change Mitigation: Bangladeshi Citizen's Engagement and Responsibility" based on open access articles. We identified relevant keywords and search terms and conducted a literature search on open access databases like PubMed Central, Scopus. A range of open access articles, including research papers, review articles, and other publications related to the topic, were collected. Each article was critically evaluated, taking into consideration factors such as the quality of the research, the credibility of the authors, and the impact of the publication. Once a sufficient number of open access articles were identified, we organized them thematically, grouping them according to similarities and differences in their content and approach. The findings from the open access articles were then summarized and synthesized, highlighting important trends, gaps, and insights related to the topic. Finally, we discussed the implications of our review for future research, policy, and practice in the field.

### Current status of climate change in Bangladesh

Bangladesh is one of the countries that is most vulnerable to the impacts of climate change. As a low-lying country with a large population and a high degree of poverty, Bangladesh faces multiple challenges in adapting to the changes in weather patterns and rising sea levels caused by climate change [1,2]

The most significant effects of climate change on Bangladesh include rising sea levels, increased frequency and severity of flooding and cyclones, and changes in rainfall patterns. Bangladesh is also experiencing more prolonged heatwaves, which are taking a toll on public health, and extreme weather events such as storms, which can cause significant damage to infrastructure and communities [2,5].

One of the most pressing issues for Bangladesh is the impact of sea level rise. The country has one of the longest coastlines (Cox's Bazar) in the world, and many people live in low-lying areas that are highly vulnerable to flooding. Rising sea levels could displace millions of people and lead to significant economic losses. The country has already started to experience the effects of sea-level rise, with saline intrusion affecting agricultural land and freshwater sources [6,7].

Flooding is also a significant issue in Bangladesh, with many regions experiencing regular floods that disrupt livelihoods, damage infrastructure, and cause health problems. These floods are becoming more frequent and severe, and the country's infrastructure is often not equipped to cope with the scale of the problem [8-10].

The government of Bangladesh has taken several steps to address the impacts of climate change. The country has developed a comprehensive National Adaptation Program of Action (NAPA) to identify priority areas for adaptation, and the government is investing in measures to improve climate resilience, such as building flood shelters, raising homes and roads above flood levels, and developing early warning systems for cyclones and other extreme weather events. Bangladesh has also taken steps to reduce greenhouse gas emissions, such as promoting renewable energy sources like solar power and developing a national climate change strategy. The country is also working with international partners to access funding and technical support for adaptation and mitigation measures [11-13].

Despite these efforts, much more needs to be done to address the ongoing and future impacts of climate change in Bangladesh. The country needs more resources to invest in climate adaptation measures, and it is crucial that international cooperation and support are provided to help Bangladesh address the effects of climate change. Additionally, reducing greenhouse gas emissions at a global level is essential to slow down the rate of climate change and mitigate its impacts on vulnerable countries like Bangladesh.

### Mitigation

Mitigating climate change is essential to reducing its negative impacts on vulnerable communities in Bangladesh. The country has developed a number of initiatives to reduce greenhouse gas emissions, such as the development of climate smart villages, the promotion of renewable energy, and the implementation of sustainable transport systems. Additionally, efforts are underway to improve the efficiency of industries and reduce carbon emissions. Mitigation efforts in Bangladesh are critical to achieving global climate goals, and they require the active involvement of citizens to be successful [14-17].

### Possible Mitigation Steps

Bangladesh is one of the most vulnerable countries to the impacts of climate change, including sea-level rise, more frequent and severe natural disasters, and changes in rainfall patterns. To mitigate the effects of climate change in Bangladesh, there are several steps that can be taken at the national level. Here are some possible mitigation steps:

- Promote renewable energy: Bangladesh has significant potential for renewable energy, such as solar, wind, and hydroelectric power. Increasing the use of renewable energy sources can reduce the country's dependence on fossil fuels and help reduce greenhouse gas emissions.
  - Increase energy efficiency: Improving the efficiency of buildings, vehicles, and industries can reduce energy demand and lower emissions.
  - Enhance public transportation: Developing and expanding public transportation systems, such as buses and trains, can reduce carbon emissions from transportation.
  - Improve waste management: Implementing effective waste management strategies, such as reducing waste generation, recycling, and composting, can reduce methane emissions from landfills.
  - Promote sustainable agriculture: Encouraging farmers to adopt sustainable practices, such as crop diversification, agroforestry, and efficient use of fertilizers and irrigation, can help reduce emissions from agriculture and improve food security.
  - Protect and restore ecosystems: Protecting and restoring natural ecosystems, such as forests and wetlands, can help reduce greenhouse gas emissions and provide important co-benefits, such as biodiversity conservation, flood protection, and erosion control.
  - Educate and raise awareness: Raising public awareness about the impacts of climate change and the importance of mitigation efforts can help mobilize public support for action and encourage individuals to take action in their own lives.
- public transportation instead of driving a car can significantly reduce carbon emissions.
  - Reduce waste: Reduce, reuse, and recycle whenever possible. Composting organic waste can also help reduce methane emissions.
  - Use water wisely: Conserving water not only reduces energy use but also helps preserve water resources for future generations.
  - Support renewable energy: Consider investing in renewable energy sources like solar panels or wind turbines to power homes and businesses.
  - Support sustainable agriculture: By choosing locally grown, organic produce and reducing meat consumption, individuals can help reduce greenhouse gas emissions from agriculture.
  - Advocate for climate action: Encourage elected officials to take action on climate change and support policies that prioritize reducing greenhouse gas emissions.

These are just a few possible mitigation steps that Bangladesh can take to address the impacts of climate change [14,16,18]. Implementing these strategies will require significant investments in technology, infrastructure, and institutional capacity, as well as cooperation and collaboration among stakeholders from government, civil society, and the private sector.

### Citizen Engagement

Citizen engagement is an essential component of climate change mitigation efforts in Bangladesh. The active involvement of citizens in climate, education programs, and civil society organizations can help promote sustainable practices and reduce greenhouse gas emissions. The government has also emphasized the importance of citizen involvement in its climate change action plan, recognizing that without the active participation of citizens, it will be challenging to achieve climate goals. Engaging citizens in climate change mitigation efforts can help raise awareness, promote behavioral change, and ensure the sustainability of mitigation efforts [15,19].

### Responsibility of Citizen

Climate change is a worldwide problem that affects everyone, including the people of Bangladesh. While some actions to mitigate climate change require large-scale policy changes and technological advancements, individuals can also take steps to reduce their carbon footprint and contribute to climate change mitigation efforts. Here are some ways in which the general population of Bangladesh can take responsibility for climate change mitigation:

- Reduce energy consumption: By using energy-efficient appliances, turning off lights and electronics when not in use, and reducing unnecessary travel, individuals can reduce their energy consumption and thus their carbon footprint.
- Choose sustainable transportation: Walking, cycling, or taking

Individual responsibility is an essential element of mitigating the effects of climate change [19,20]. In Bangladesh, citizens can take responsibility by adopting sustainable practices in their daily lives, such as reducing energy consumption, promoting eco-friendly transportation, and reducing waste. Civil society organizations can also play a vital role in promoting responsibility by advocating for policy changes, raising awareness, and mobilizing communities to take action. It is crucial to recognize that individuals, institutions, and governments all share a responsibility to mitigate climate change. It's essential to understand that everyone has a role to play in mitigating climate change. By making small changes in our daily lives and advocating for broader policy changes, we can all contribute to a more sustainable future.

### Sustainable Practices

Sustainable practices are essential to mitigating the negative impacts of climate change. In Bangladesh, sustainable practices such as energy efficiency, renewable energy, and eco-friendly transportation can help reduce greenhouse gas emissions and promote sustainability. The government and civil society organizations are promoting sustainable practices through initiatives such as the Green School program, which promotes sustainable practices in schools and educates students about climate change. Sustainable practices can reduce the negative impacts of climate change while promoting economic growth and improving quality of life.

There are many sustainable practices that individuals and organizations can undertake to help mitigate the effects of climate change. Some of these practices include:

- Reduce carbon footprint: One of the biggest contributors to climate change is the emission of greenhouse gases, primarily carbon dioxide. By reducing your carbon footprint, you can help to mitigate the effects of climate change. This can be done by using energy-efficient appliances and vehicles, reducing energy usage, and choosing renewable energy sources.
- Reduce waste: Landfills contribute to greenhouse gas emissions, primarily through the production of methane gas. By reducing waste, we can reduce the amount of methane produced in landfills. This can be achieved by practicing the 3Rs: Reduce, Reuse, and Recycle.
- Plant Trees: Trees absorb carbon dioxide and other pollutants from the atmosphere, making them an important tool in mitigating climate change. Planting trees in your community or supporting reforestation efforts can have a significant impact.

- Promote sustainable agriculture: Agriculture is a significant source of greenhouse gas emissions, primarily through the use of fertilizers and animal husbandry. Promoting sustainable agriculture practices such as organic farming and reducing meat consumption can help to mitigate the effects of climate change.
- Support renewable energy: Renewable energy sources such as solar, wind, and hydropower are key to reducing greenhouse gas emissions. Supporting the development and use of renewable energy sources can help to mitigate the effects of climate change.
- Reduce water usage: Water is a valuable resource that is becoming increasingly scarce in some parts of the world. Reducing water usage through conservation practices such as using low-flow showerheads and toilets can help to mitigate the effects of climate change.
- Advocate for policy changes: Individuals can also make a difference by advocating for policy changes at the local, state, and national levels. This can include supporting legislation that promotes renewable energy, reducing emissions, and protecting natural resources.
- These are just a few examples of sustainable practices that can help to mitigate the effects of climate change [21,22]. By taking action today, we can help to create a more sustainable future for ourselves and future generations.

### Resilience

Building resilience is critical to mitigating the effects of climate change in Bangladesh. The country is vulnerable to natural disasters such as floods, cyclones, and droughts, which are increasing in frequency and intensity due to climate change. Building resilience requires reducing vulnerability and increasing adaptive capacity. Initiatives such as climate-smart villages and disaster risk reduction can help increase resilience by improving infrastructure, promoting sustainable practices, and increasing access to information. Building resilience is essential to reducing the negative impacts of climate change and promoting sustainable development in Bangladesh [23,24].

### Governmental Steps for Climate Change Mitigation

Here are some steps that the government of Bangladesh can take for climate change mitigation:

- Develop and implement policies that encourage the use of renewable energy sources such as solar, wind, and hydropower. The government can provide subsidies, tax incentives, and other financial assistance to promote the adoption of renewable energy technologies.
- Improve energy efficiency in buildings, industries, and transportation by implementing building codes and standards, promoting the use of energy-efficient appliances and vehicles, and introducing fuel economy standards for vehicles.
- Reduce emissions from the transportation sector by promoting public transportation, cycling, and walking, and investing in low-emission public transport infrastructure such as electric buses, trains, and light rail.
- Increase forest cover and reduce deforestation by implementing sustainable land-use practices, promoting afforestation and reforestation, and protecting forests and wetlands from illegal logging, mining, and other activities that cause deforestation.
- Encourage sustainable agriculture practices such as agroforestry, organic farming, and conservation tillage to reduce greenhouse gas emissions from the agriculture sector.
- Improve waste management practices, including reducing waste generation, increasing recycling and composting, and

- promoting the use of clean waste-to-energy technologies.
- Promote the use of climate-friendly technologies such as low-emission cookstoves, energy-efficient lighting, and refrigeration, and water-efficient irrigation systems.
- Develop and implement policies that encourage industries to adopt cleaner production processes and technologies, such as carbon capture and storage, and reduce their greenhouse gas emissions.
- Promote public awareness and education on climate change and encourage people to take action to reduce their own carbon footprint.
- Increase collaboration with international organizations and other countries to access climate finance, technology transfer, and capacity-building support.

These steps can help Bangladesh reduce its greenhouse gas emissions and contribute to global efforts to address climate change [18,21,23]. However, it will require sustained political commitment, collaboration among stakeholders, and significant investments in low-carbon technologies and infrastructure to achieve meaningful progress.

### Non-Governmental Organizations Steps for Climate Change Mitigation

Here are some steps that NGOs can take for climate change mitigation in Bangladesh:

- Raise public awareness and promote education about climate change and its impacts. NGOs can organize campaigns, workshops, and training programs to educate the public about climate change, its causes, and solutions.
- Support community-based adaptation and resilience-building initiatives. NGOs can work with vulnerable communities to help them adapt to the impacts of climate change and build resilience by developing sustainable livelihoods, water management systems, and disaster risk reduction measures.
- Promote renewable energy and energy efficiency technologies in households and communities. NGOs can provide technical support and training to promote the adoption of solar energy systems, energy-efficient appliances, and other clean energy technologies.
- Advocate for policies and regulations that promote low-carbon development and protect natural resources. NGOs can engage with policymakers and other stakeholders to promote policies and regulations that support renewable energy, sustainable land-use practices, and forest conservation.
- Encourage sustainable agriculture practices such as agroforestry, organic farming, and conservation tillage to reduce greenhouse gas emissions from the agriculture sector.
- Support forest conservation and reforestation initiatives to increase forest cover and reduce carbon emissions. NGOs can work with communities to promote sustainable forest management practices and support the planting of trees.
- Promote sustainable waste management practices such as composting and recycling, and advocate for policies that encourage waste reduction and the use of clean waste-to-energy technologies.
- Support the development of climate-friendly technologies, such as low-emission cookstoves and energy-efficient lighting, by working with local entrepreneurs and supporting innovation in these areas.
- Encourage sustainable transport systems, such as cycling and public transport, by working with communities to promote these alternatives to private car use.
- Build partnerships and collaborations with other organizations,

including government agencies, businesses, and academic institutions, to scale up climate change mitigation efforts and increase their impact.

By taking these steps, NGOs can play a critical role in promoting climate change mitigation efforts in Bangladesh, building resilience and adaptation, and helping communities transition to a low-carbon, sustainable future [25-27].

### Established Climate-Friendly Policies in Bangladesh

Bangladesh has made significant progress in establishing green activities and promoting sustainable practices. However, there is still much work to be done to ensure a sustainable future for the country. To further establish green activities in Bangladesh, there are several steps that can be taken.

Firstly, it is crucial to increase public awareness of the importance of sustainability through educational campaigns, public awareness programs, and media outreach.

Secondly, promoting renewable energy such as solar, wind, and hydropower can reduce reliance on fossil fuels, decrease greenhouse gas emissions, and create new job opportunities.

Thirdly, waste reduction, recycling, and composting can help to reduce the environmental impacts of waste.

Fourthly, promoting sustainable agriculture practices such as organic farming can help to reduce emissions and improve soil quality.

Moreover, planting trees can sequester carbon dioxide and improve air quality. Bangladesh has made significant progress in planting trees, but more needs to be done to address deforestation and promote reforestation. In addition, promoting green transportation options such as electric vehicles, bicycles, and public transportation can help to reduce emissions and improve air quality. Lastly, individuals and organizations can advocate for policy changes at the local, state, and national levels to promote sustainability. By taking steps such as increasing awareness, promoting renewable energy, reducing waste, encouraging sustainable agriculture, planting trees, supporting green transportation, and advocating for policy changes, Bangladesh can continue to make progress towards a more sustainable future [28,29].

### The Go Green Project and Its Importance

The Go Green project is a nationwide campaign aimed at promoting sustainable practices, reducing greenhouse gas emissions, and adapting to the impacts of climate change. The project includes several activities such as planting trees, promoting renewable energy, reducing waste, and promoting sustainable agriculture. Here are some of the reasons why the Go Green project is crucial for Bangladesh:

- **Mitigating the effects of climate change:** By promoting sustainable practices, the Go Green project can help to reduce greenhouse gas emissions and mitigate the effects of climate change. This can include reducing energy usage, promoting renewable energy, and reducing waste.
- **Building resilience:** Bangladesh is highly vulnerable to the impacts of climate change, and the Go Green project can help to build resilience to these impacts. This can include planting trees to reduce the risk of flooding, promoting sustainable agriculture to adapt to changing weather patterns, and promoting energy-efficient buildings to reduce the risk of power outages during extreme weather events.

- **Improving public health:** Climate change has significant public health impacts, including increased rates of infectious diseases and heat-related illnesses. By promoting sustainable practices such as reducing air pollution, the Go Green project can help to improve public health outcomes.
- **Economic benefits:** The Go Green project can also have significant economic benefits for Bangladesh. For example, promoting renewable energy can create jobs and reduce reliance on expensive imported fuels. Planting trees can also have economic benefits, such as improving soil quality and providing a source of income for local communities through eco-tourism.

The Go Green project is a vital initiative in Bangladesh for climate change mitigation.(28–30) By promoting sustainable practices, building resilience, improving public health outcomes, and providing economic benefits, the project can help to create a more sustainable and resilient future for Bangladesh.

### Discussion

Climate change is a global crisis that has a disproportionate impact on the people and ecosystems of Bangladesh. The country is facing multiple climate-related challenges, including sea-level rise, increased frequency and intensity of cyclones and floods, droughts, and extreme heat. These issues are threatening the livelihoods and well-being of millions of people in Bangladesh, which is why climate change mitigation is of paramount importance [1,2,6,17].

Mitigation refers to the measures taken to reduce the amount of greenhouse gases (GHGs) emitted into the atmosphere and to limit the impacts of climate change. Mitigation is crucial because it can help prevent or slow down some of the worst effects of climate change [15,17,20]. Possible mitigation steps that Bangladesh can take include investing in renewable energy, promoting energy efficiency, promoting sustainable transportation, and reducing deforestation.

Citizen engagement is also essential in mitigating climate change. It is the responsibility of every citizen to play their part in mitigating climate change. Individuals can take steps such as reducing energy consumption, using public transportation or carpooling, reducing waste, and promoting sustainable practices [17,21,28]. Sustainable practices such as using renewable energy sources, recycling, and reducing the use of plastic can also contribute to mitigation efforts.

Resilience is another important aspect of climate change mitigation. Building resilience can help communities withstand the impacts of climate change and recover more quickly from disasters. The government can take steps to increase resilience, such as investing in early warning systems, improving infrastructure, and creating contingency plans for disasters [23,24,27].

The government of Bangladesh can take several steps to mitigate climate change. These include developing policies and regulations to promote renewable energy, improving energy efficiency in buildings and transportation, and promoting sustainable agriculture and forestry practices. The government can also invest in climate-smart infrastructure, such as sea walls, and develop programs to increase awareness and education about climate change [17-20]. Non-governmental organizations (NGOs) can also play a vital role in climate change mitigation. NGOs can work with communities to promote sustainable practices and provide training and resources to help communities become more resilient to the impacts of climate change [25,27]. NGOs can also advocate for policies and regulations that promote climate change mitigation and work with

the government and other stakeholders to develop and implement climate change strategies.

### Conclusion

climate change is a global issue that requires collective action from all nations and individuals. Bangladesh, being a vulnerable country, is heavily impacted by climate change and its citizens have an important role to play in mitigating its effects. Through engagement and responsibility, Bangladeshi citizens can contribute to reducing greenhouse gas emissions, promoting sustainable practices, and adapting to the changing climate. There are various ways that Bangladeshi citizens can engage in climate change mitigation efforts, such as promoting renewable energy, reducing waste, and conserving natural resources. Additionally, the government and other organizations can play a crucial role in educating and empowering citizens to take action against climate change.

However, it is important to acknowledge that climate change mitigation requires collective action beyond individual efforts. The government and international community must also take significant steps to reduce greenhouse gas emissions and provide support to vulnerable communities like Bangladesh to adapt to the impacts of climate change.

### Recommendations

Bangladeshi citizens can make a significant contribution to mitigating climate change by taking responsibility for their actions and engaging in sustainable practices. However, concerted efforts by all sectors of society are needed to address this global issue and protect the planet for future generations.

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