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| Title | Statistical and Mathematical Approaches to Understanding Climate Change Impacts and Challenges in Bangladesh | | |
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| Abstract |  |
| **Objective**:  This research aims to employ statistical and mathematical methods to comprehensively analyze the impacts of climate change and associated challenges in Bangladesh. By quantifying these impacts, our objective is to provide a more precise understanding of the specific issues facing this vulnerable nation due to climate change.  **Methodology**:  We collected historical climate data and relevant socio-economic information from World Bank database to build a comprehensive dataset for Bangladesh. Utilizing time series analysis, regression models, and correlation studies, we examined climate variables and their influence on various sectors such as agriculture, infrastructure, and health. We also developed mathematical models to project future climate scenarios and their potential impacts on Bangladesh. These models integrated climate change predictions and regional factors.  **Research outcomes**:  **Quantified Climate Trends**: Our statistical analysis has revealed significant climate trends in Bangladesh, including rising temperatures, changing precipitation patterns, and increased frequency of extreme weather events.  **Sector-Specific Impacts**: By analyzing the data, we have identified sector-specific vulnerabilities. For instance, the agricultural sector is particularly sensitive to changing rainfall patterns, while the coastal regions are at higher risk due to sea-level rise and cyclone frequency.  **Future Projections**: Our mathematical models will provide projections of climate change impacts in Bangladesh over the coming decades. These projections will help in planning adaptation and mitigation strategies.  **Policy Implications**: We will provide data-driven recommendations for policymakers, emphasizing the urgency of climate action in Bangladesh, considering its unique challenges.  **Conclusion**:  Our research, employing statistical and mathematical methods, will offer a detailed and quantifiable insight into the challenges and impacts the nation faces. These findings will facilitate more targeted policy decisions, better preparation, and resilience-building strategies to protect the people and ecosystems of Bangladesh in the face of climate change. It is our hope that this research will contribute to the broader global conversation on climate change mitigation and adaptation and serve as a blueprint for similar studies in vulnerable regions worldwide. | |