# ‘’India's Energy Landscape (1991-2019): Unveiling Challenges and Climate Effects"

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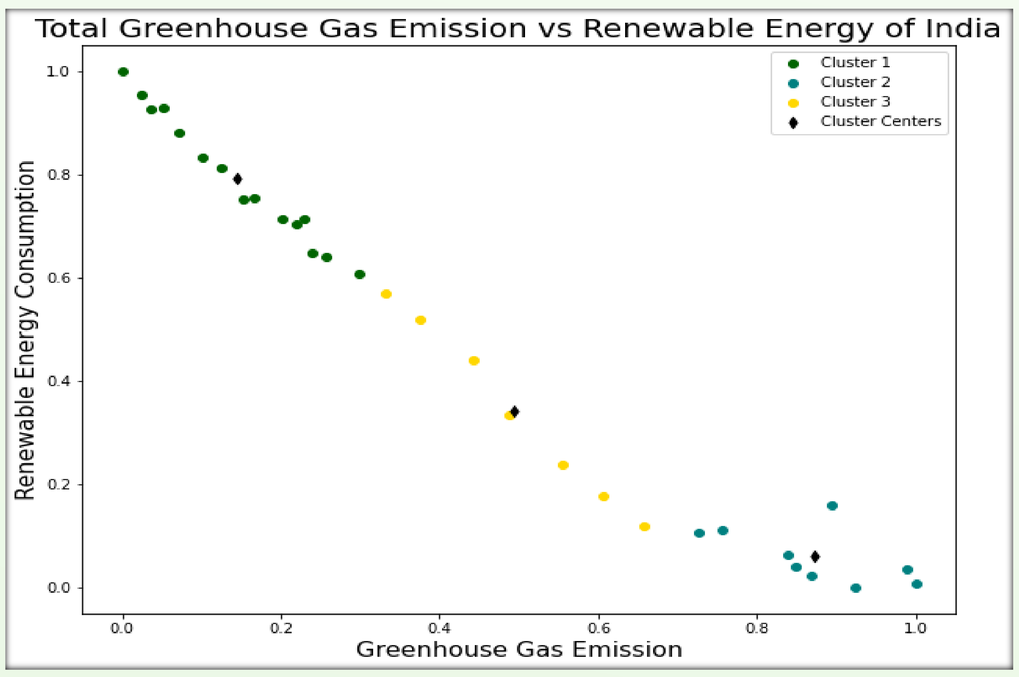
## Abstract:

This research explores India's pivotal role in the climate change landscape, focusing on the intricate link between rising greenhouse gas emissions and declining renewable energy adoption from 1991 to 2019. Utilizing k-means clustering and predictive insights post-2019, the study aims to inform sustainable strategies in the face of the urgent need for action.

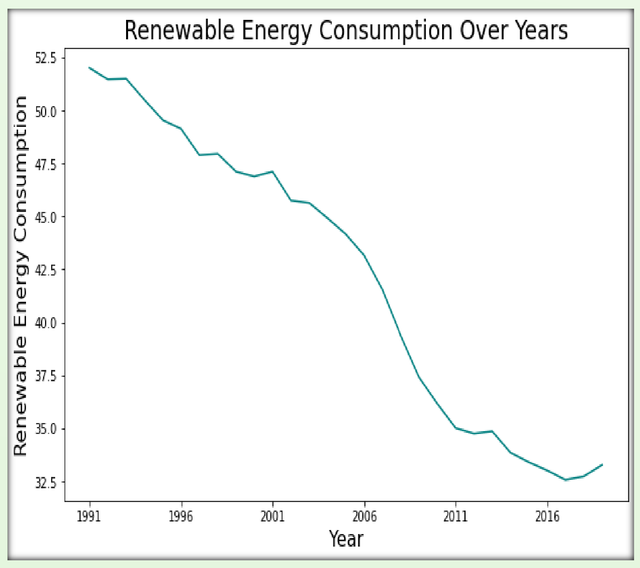

## Introduction:

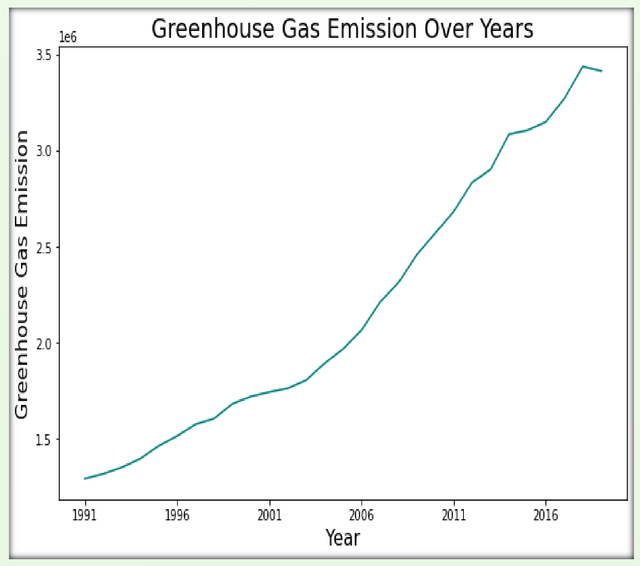
In the context of intensifying climate change concerns, this research delves into India's critical position. Examining the connection between escalating greenhouse gas emissions and decreasing adoption of renewable energy from 1991 to 2019, the study employs k-means clustering and predictive insights post-2019, utilizing data sourced from the World Bank.

Examining the clustered graph on India's greenhouse gas emissions and renewable energy usage unveils a clear trend: reduced reliance on renewable energy aligns with higher emissions, signalling potential impacts on India's climate and biodiversity.



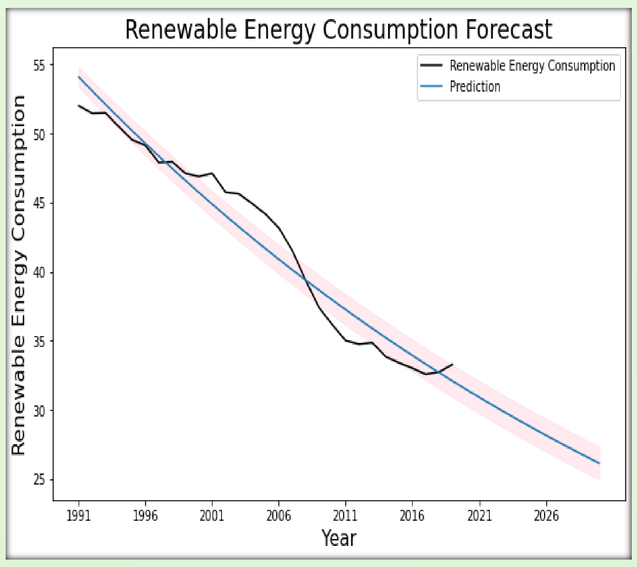

Each cluster signifies a distinct environmental scenario, providing insights into the diverse effects of renewable energy consumption.

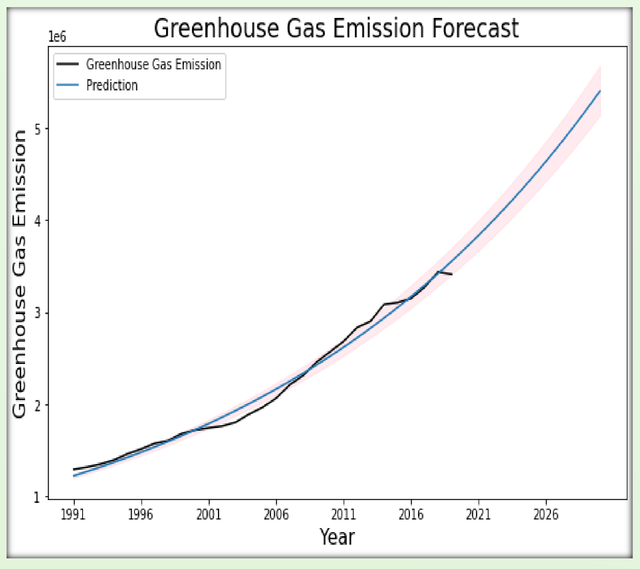



The declining trend in renewable energy consumption, as depicted in the line graph, unfolds a worrisome narrative. This consistent decrease is intimately tied to the simultaneous escalation in total greenhouse gas emissions. The implications of this tandem movement extend beyond numerical values, influencing temperature, climate patterns, and the overall environmental equilibrium.

Looking ahead, the forecast graph, mirroring the established pattern, extends the disconcerting trajectory beyond 2019. Notably, the projection holds steady until the final represented year in 2030. This prolonged trend signals a persistent environmental challenge for India, with potential ramifications for climatic stability and biodiversity.




## Conclusion:

The observed and forecasted trends in India's renewable energy consumption and greenhouse gas emissions paint a sobering picture. The consistent decline in renewable energy usage, coupled with a parallel increase in greenhouse gas emissions, underscores the pressing need for immediate and impactful interventions.

The interplay between these factors not only affects numerical metrics but also carries far-reaching consequences for temperature, climate dynamics, and the broader environmental landscape. Recognizing the intricacies of this relationship is pivotal for charting a course toward sustainability.