Extended Abstract

Track (AM/SM/AF/AI/BD/DM/HR/ID/MT/PR/SD/SE/EG/TD/TL/RD): **SE**

Identifying factors of resilience in polymer waste induced climate change using supervised and unsupervised machine learning techniques

Arnab Banerjee[1], Antariksha Sarkar[2], Vimal Katiyar[1*], Sreedeep S[1*].

1. Department of Civil Engineering, Indian Institute of Technology Guwahati, Assam, India
2. Department of Automobile Engineering, National Institute of Technology Agartala, Tripura, India
3. Department of Chemical Engineering, Indian Institute of Technology Guwahati, Assam, India

Email:

arnabbanerjee@iitg.ac.in

antariksha.sarkar@gmail.com

vkatiyar@iitg.ac.in

srees@iitg.ac.in

**Corresponding authors*

The non-degradation of plastic/crude oil wastes is a major concern for climate scientists as much as greenhouse pollution. However, the key difference lies in the longevity of plastic wastes and the potential hazards of contamination to wildlife, which is much less prevalent in the case of greenhouse gases. As such the present situation necessitates the study of these effects and the articulation of subsequent mitigation strategies for effective climate action and policy formulation. The target is to provide the governing organizations (both regional and national) with a tangible and holistic set of parametrically driven tools wherein the administrator inputs easily obtainable climate and waste related variables in a consolidated database. The system should provide a traceable and resilient solution using the power of multi-factor optimization routines. Such an approach is potentially capable of reducing friction between the decision-making process of interdependent civic bodies while delivering an actual long-term solution to modern society's problems. Investing in this system should provide benefits in the fields of waste management, land and water resource purification, reduction in the levels of air pollution (by reducing the need for incineration) and an appreciable enhancement to financial reserves (by cost reduction and process automation). Initially the underlying trends in urbanization, waste handling and related weather changes are identified through regression analysis from historical climate data (targeting variance in phenomena over decades to find local biases and fit model with acceptable statistical error). Subsequently, the problem of polymer waste degradation is proposed to be tackled using novel multi-omics aided enzyme modelling simulations. Finally, a prediction architecture (based on Clustering and Association) is envisioned to facilitate the identification of resilience dynamics for climate administration. Policies related to plastic management are often top-down in approach, alienated from grassroot realities. Thus, implementation

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encounters unforeseen bottlenecks, rendering significant economical implications on all fronts. A concept tool for consolidated data enabled insights into multivariant factors related to plastic waste induced climate crisis, would allow rapid prototyping, leading to formulation of precise, practically implementable policies and strategies at all administrative levels for a sustainable future.

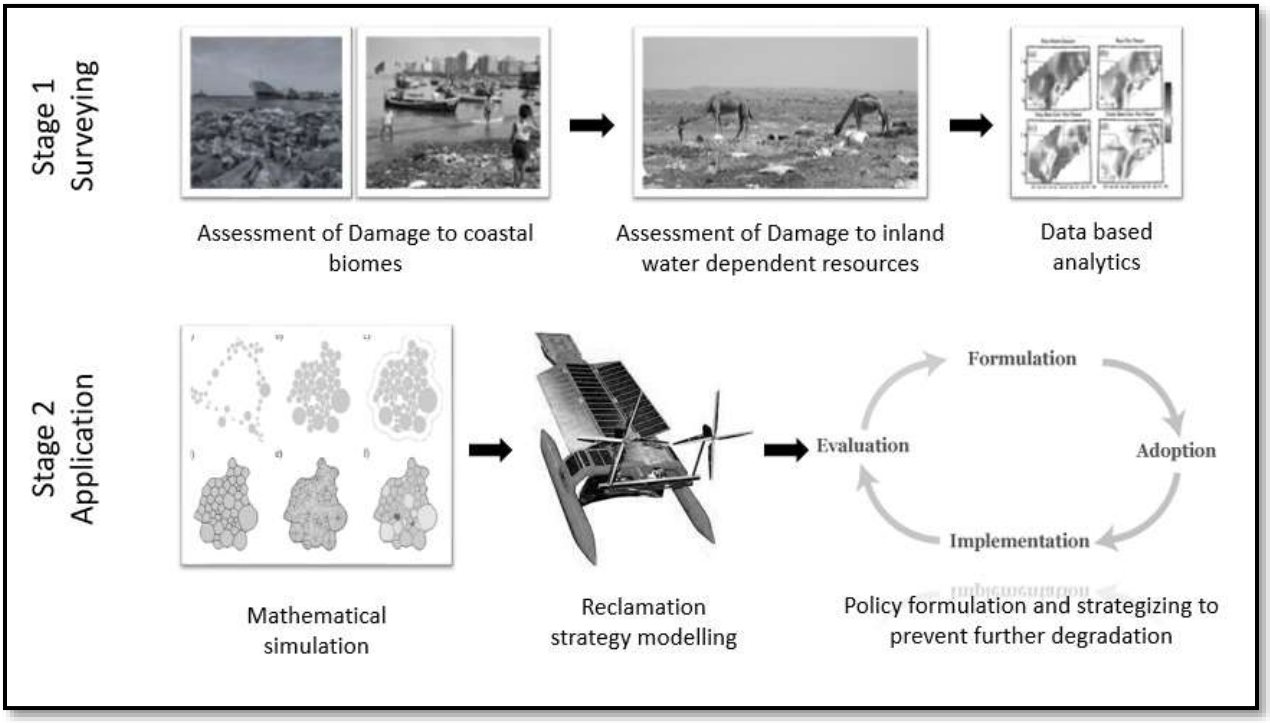

Figure 1: Graphical Abstract