Review Form 1.6

Journal Name:	**Asian Research Journal of Mathematics**
Manuscript Number:	**Ms_ARJOM_87124**
Title of the Manuscript:	**An Improved Two-states Cyclical Dynamic Model for Plastic Waste Management**
Type of the Article	**Original Research Article**

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty'**, provided the manuscript is scientifically robust and technically sound.
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PART 1: Review Comments

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Compulsory REVISION comments	Reviewer's comment The panacea to the global challenge of plastic waste management is the transition towards plastic circular economy, which can be sustained through tailor-made management strategies. However, cutting-edge strategic solutions are constrained by inadequate data due to inadequate plastic-based predictive models. This paper presents an improved version of an existing two-state cyclical dynamic closed (CDC) model. The CDC model was formulated using a homogeneous linear system of ordinary differential equations (ODEs) and was modified by introducing a separation target which plays an essential role in determining both quantity and quality of recycled plastics. The Laplace transforms technique was the main analytic solution technique used. Values of the parameters were computed using the global plastic data applied for the existing CDC model, and with a technique termed the *nth-order product derivative proximity*, alternating pairs of initial values were selected each for the global annual plastic production and the global annual plastic waste generation. The validation process of the new CDC model was accomplished using the mean average percentage error (MAPE), which is a measure of the model's predictive power. The resulting MAPEs for the new CDC model were 5% and 6.5% (as against 13% and 18% in the existing model) respectively for the global annual plastic: production and waste generation, indicating that the new model predicts with 95% and 93.5% degrees of accuracy respectively for the global annual plastic: production and waste generation. Therefore, the new CDC model has outperformed the existing CDC model in terms of predictive power, and thus, establishing the new CDC model as an improved version of the existing one. The model can therefore make impactful policy decisions for sustainable plastic waste management thereby aiding to achieve the transition towards circular economy in plastic waste management. The study contributes to science by improving the predictive accuracy of the existing CDC model for plastic waste management. The improvement was achieved by the introduction of the plastic waste separation target which cannot be neglected in modeling the dynamics of the PLC. Thus, introducing this parameter extends the existing CDC model in terms of its representation of a real-life exposition of plastic waste management. Another predictive-accuracy-determining factor is the proposal of a new technique of selecting and alternating pairs of initial values, which we have labelled the *nth*-order product derivative proximity. The improvement in the predictive accuracy will therefore, help to optimize decision-making and policy formulation for effective, efficient and sustainable plastic waste management.	
Minor REVISION comments	The main motivation and contribution should be highlighted at the end of the Introduction. 2. At the end of the Introduction, which theorems corresponding to which conclusions which should be clearly stated. 3. The numbering of equations preferred to be added according to the numbering of Sections.	
Optional/General comments		

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PART 2:

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Are there ethical issues in this manuscript?	*(If yes, Kindly please write down the ethical issues here in details)*	

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