



## **Futuristic Projection of Solid Waste Generation in Dehradun City of Uttarakhand using Supervised Artificial Neural Network-Non-Linear Autoregressive Neural Network (NARnet)**

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**Abstract** : Solid waste management has become a pressing problem in every city. Municipal Solid Waste characteristics and quantities change significantly with time. The model in the present study enables the solid waste management personnel to have prior information on the amount of future waste. A prediction model has been developed that uses the present waste generation data, along with different environmental and economic factors. These factors have been implicitly incorporated using quantity of solid waste as a time-series dataset to simulate a supervised Artificial Neural Network (ANN) in MATLAB - Nonlinear Autoregressive Neural Network (NARnet). The values of input parameter current solid waste quantity are used for estimation of output which is, amount of solid waste generated for future period of about three months, thus facilitating the pre-planning of waste management. In current work different architectures of neural network have been examined by varying the combinations of number of hidden layers, neurons in each layer and the choice of activation functions. Based on the performance criteria, the best optimized ANN architecture has been used for the prediction of quantity of solid waste.

**Keywords** : solid waste generation, artificial neural network, time series data, prediction of solid waste quantity.

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