

PREDICTING HAZE PHENOMENON USING CHAOS THEORY IN INDUSTRIAL AREA IN MALAYSIA

(Peramalan Jerebu Menggunakan Teori Kalut di Kawasan Perindustrian Malaysia)

HAZLINA DARMAN* & NOR ZILA ABD HAMID

ABSTRACT

Predicting the occurrence of haze is of great importance due to its negative impact on human health, the environment, and the economy. This study aims to develop a model for predicting haze using chaos theory. The data were taken from an industrial area, Klang, Selangor Malaysia during Southwest Monsoon. The model is trained using historical data on haze occurrences and the accuracy of the prediction is evaluated using a testing dataset. A chaos model, namely local mean approximation method (LMAM) will be used to predict the haze phenomenon. Results show that the chaos-based approach is effective in forecasting the onset and duration of haze events. The predicting model can provide early warnings for policymakers and relevant authorities, enabling them to take proactive measures to mitigate the effects of haze on public health and the environment. The model also presents a promising alternative to traditional forecasting techniques and highlights the potential applications of chaos theory in atmospheric science.

Keywords: haze forecasting; PM10; chaos theory; Cao method; sustainability development goals

ABSTRAK

Peramalan jerebu adalah sangat penting kerana memberi kesan negatif kepada kesihatan manusia, alam sekitar, dan ekonomi negara. Kajian ini akan membangunkan model peramalan jerebu menggunakan teori kalut. Data siri masa di ambil di kawasan perindustrian Klang, Selangor Malaysia semasa berlakunya musim Monsun Barat Daya. Teori kalut membahagikan data kepada dua: data latihan dan data ujian. Data latihan digunakan untuk membina model peramalan dan data ujian digunakan untuk membandingkan ketepatan model peramalan. Kaedah Penghampiran Purata Setempat (KPPS) akan digunakan dalam proses peramalan jerebu. Hasil kajian ini menunjukkan kaedah kalut sesuai diaplikasi dalam peramalan jerebu. Model peramalan jerebu mampu memberikan amaran awal kepada pihak berkuasa dan penggubal dasar untuk mengambil tindakan proaktif dalam mengurangkan kesan buruk jerebu kepada kesihatan awam dan persekitaran.

Kata kunci: peramalan jerebu; PM10; teori kalut; kaedah Cao; matlamat pembangunan mampan

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*Department of Mathematics,
Faculty of Science and Mathematics,
Universiti Pendidikan Sultan Idris
35900, Tanjung Malim, Perak DR, MALAYSIA
E-mail: hazlinadarman@gmail.com*, nor.zila@fsmt.upsi.edu.my*

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*Corresponding author