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Establishing Econometric Modeling Equations for Lumpy Skin Disease Outbreaks in the Nile Delta of Egypt under Current Climate Conditions

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Abstract : This paper aimed to establish econometrical equation models for the Nile delta region in Egypt, which will represent a basement for future predictions of Lumpy skin disease outbreaks and its pathway in relation to climate change. Data of lumpy skin disease (LSD) outbreaks were collected from the cattle farms located in the provinces representing the Nile delta region during 1 January, 2015 to December, 2015. The obtained results indicated that there was a significant association between the degree of the LSD outbreaks and the investigated climate factors (temperature, wind speed, and humidity) and the outbreaks peaked during the months of June, July, and August and gradually decreased to the lowest rate in January, February, and December. The model obtained depicted that the increment of these climate factors were associated with evidently increment on LSD outbreaks on the Nile Delta of Egypt. The model validation process was done by the root mean square error (RMSE) and means bias (MB) which compared the number of LSD outbreaks expected with the number of observed outbreaks and estimated the confidence level of the model. The value of RMSE was 1.38% and MB was 99.50% confirming that this established model described the current association between the LSD outbreaks and the change on climate factors and also can be used as a base for predicting the of LSD outbreaks depending on the climatic change on the future.

Keywords : LSD, climate factors, Nile delta, modeling
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