**MACHINE LEARNING PROJECT – CRN 31143**

**Project: Machine Learning with Natural disaster implementation on crop cultivation in the agricultural process**

**Team Members:**

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**ABSTRACT:**

Crop yield analysis is a rapidly developing research area. As per the National Policy on Disaster Management, agricultural impacts caused by natural disasters include a variety of occurrences like seismic activities, inundations, arid spells, tropical storms, tidal waves, slope failures, and snowslides. Seasonal and occasional catastrophes are the two types of disasters. Seasonal calamities such as weather and climatic variations such as rainfall pose consistent problems for farmers across the country.

Natural disasters profoundly affect agriculture. Farmers aim to forecast their crop yield in diverse climate and disaster scenarios. "Our prediction analysis encompasses a variety of attributes, such as natural disasters (earthquakes, floods, droughts, cyclones, tsunamis, landslides, avalanches), weather, temperature, soil type, nutrient content, rainfall, and soil composition. We will employ diverse machine-learning techniques to train the collected data and develop a model. These data properties will be analyzed and trained using multiple machine-learning methods to create the model."

The system includes a model that is exact and reliable in forecasting crop production and providing the end user with suitable suggestions regarding the needed fertilizer ratio based on atmospheric and soil factors of the land, which improves crop yield and farmer revenue.

**OBJECTIVES:**

1) To study agricultural cultivation affected by recurring seasonal catastrophes like weather variations, including rainfall, causing consistent problems for farmers nationwide.

2) To study the effects of occasional disasters, such as tsunamis, on agricultural cultivation and their significant impact on the agricultural sector.

3) Examine the relevant qualities employed in prediction analysis, including earthquakes, floods, droughts, cyclones, tsunamis, landslides, and avalanches.

4) Conduct data analysis considering weather conditions, temperature, soil type, nutrient content, and regional rainfall to determine the optimal crop selection for planting.

**PROJECT EXECUTION PLAN:**

This work will analyze the agricultural catastrophe dataset. We will pre-process the dataset, removing noisy and null value data. Afterward, we will examine and prepare the data for further processing. The analysis will employ machine learning techniques.

**EVALUATION:**

The project assessment may use the findings of the machine learning algorithm prediction. As the machine learning algorithm plays a crucial role in supporting agriculture, the evaluation of outcomes will depend on the accuracy of the algorithm's predictions. We will use the Google Colab Python Tool to create the application, enabling instant execution on any internet-connected computer system. Users do not need to install additional software on their machines. The Colab Tool facilitates the development and execution of the application directly within the cloud server, where the Python library files are stored. We construct the machine learning algorithm libraries within Colab.

**REFERENCES/BIBLIOGRAPHY:**

[1] [Md Shah Jalal Jamil](https://ieeexplore.ieee.org/author/37089510277);[Afra Anika](https://ieeexplore.ieee.org/author/37086240840);[Md. Saddam Hossain Mukta](https://ieeexplore.ieee.org/author/38490005500);[Mohammad Nurul Huda](https://ieeexplore.ieee.org/author/37408268500), "Ensemble of Classifiers Based Soil Evaluation for Crop Cultivation”, 2022 IEEE Region 10 Symposium.

[2] Sabbir Ahmed; Shamima Yesmin; Lata Rani Saha; A. K. M. Sadat; Mozammel H A Khan “Major Cropping Pattern Prediction in Bangladesh from Land, Soil and Climate Data Using Machine Learning Techniques”, 2022, 25th International Conference on Computer and Information Technology (ICCIT).

[3] [Swati Vashisht](https://ieeexplore.ieee.org/author/37085587728); [Praveen Kumar](https://ieeexplore.ieee.org/author/37085348077); [Munesh Chandra Trivedi](https://ieeexplore.ieee.org/author/37061253800) “ [Improvised Extreme Learning Machine for Crop Yield Prediction](https://ieeexplore.ieee.org/document/9853054/)” [2022- 3rd International Conference on Intelligent Engineering and Management (ICIEM)](https://ieeexplore.ieee.org/xpl/conhome/9853009/proceeding).

[4] M. S. J. Jamil, A. K. M. M. Islam, B. Ahamed, and M. N. Huda, "Iprocad: Intelligent prognosis of coronary artery disease excluding angiogram in a patient with stable angina", International Journal of Innovative Technology and Exploring Engineering, vol. 9, no. 5, pp. 2032-2040, 2020.

[5] Agriculture Extension Office (2010): Kalapara, Patuakhali, Bangladesh. Ahmed, M. & Suphachalasai, S. (2009): "Assessing the Costs of Climate Change and Adaptation in South Asia."

[6] M. Yang, D. Xu, S. Chen, H. Li, and Z. Shi, "Evaluation of machine learning approaches to predict soil organic matter and pH using vis-NIR spectra," Sensors, vol. 19, no. 2, pp. 263, 2019.

[7] Agrawala, S., Ota, T., Ahmed, A.U., Smith, J., van Aalst, M. (2003): "Development and climate change in Bangladesh: focus on coastal flooding and the Sundarbans," OECD, Paris. Agriculture Extension Office (2010): Kalapara, Patuakhali, Bangladesh.

[8] Ahmed, M. & Suphachalasai, S, (2009): "Assessing the Costs of Climate Change and Adaptation in South Asia".