**IMPACT OF CLIMATIC EXTREMES ON SOYBEAN AND CORN PRODUCTION IN ONTARIO**

**Name: Sundas Ahmed**

**Student Number: 500910967**

**Data: 25th September 2023**

**CIND820: Big Data Analytics Project**

**Abstract**

Climate variability has affected agriculture sector across Canada. Agriculture sector in Ontario is worth $45 billion and constitutes about 1.2% of the province’s total GDP. According to statistics Canada 2022 data, agriculture was a source of livelihood for 79,382 people across the province of Ontario. Ontario is a provincial leader in soybean and corn production. However, extreme weather events like dry spells and heavy rainfalls have affected farmers across southern Ontario. In 2022, Ontario’s soybean and wheat production fell by 2.1% and 22.7%. This paper examines the effects of climatic factors on the mean production of soybean and corn crop in Ontario, Canada, over a period of 30 years i.e., from 1991-2020. The paper utilized the time series data of climatic variable including precipitation, temperature, and non climatic variable of area per hectare. In this capstone project, the research begins by examining certain parameters to predict the relationship of crop productions with the climatic variables and their spatial distribution over time. It investigates the role of climate change in altering the crop production. The selected parameters would be used to explore a series of supervised machine learning algorithms to determine its effect on the crop production in Ontario. These parameters will be tested in python against various machine learning algorithms for the performance measures such as logistic regression, decision tree classifier, random forest classifier, k-nearest neighbour regression.

Datasets for project:

<https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3210035901>

[Download Data | Climate Change Knowledge Portal (worldbank.org)](https://climateknowledgeportal.worldbank.org/download-data)

<https://climatedata.ca/download/#var-download>