

Trends in Cereal Yield Production: An Agricultural Analysis

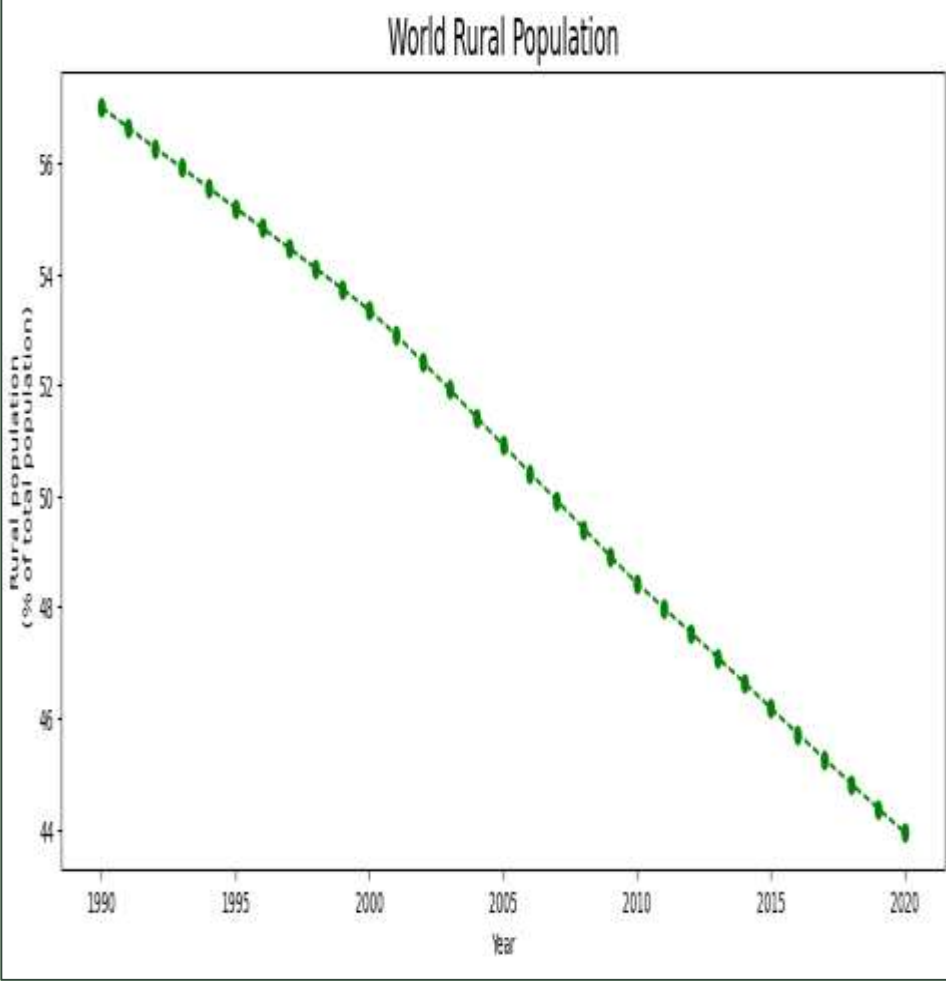
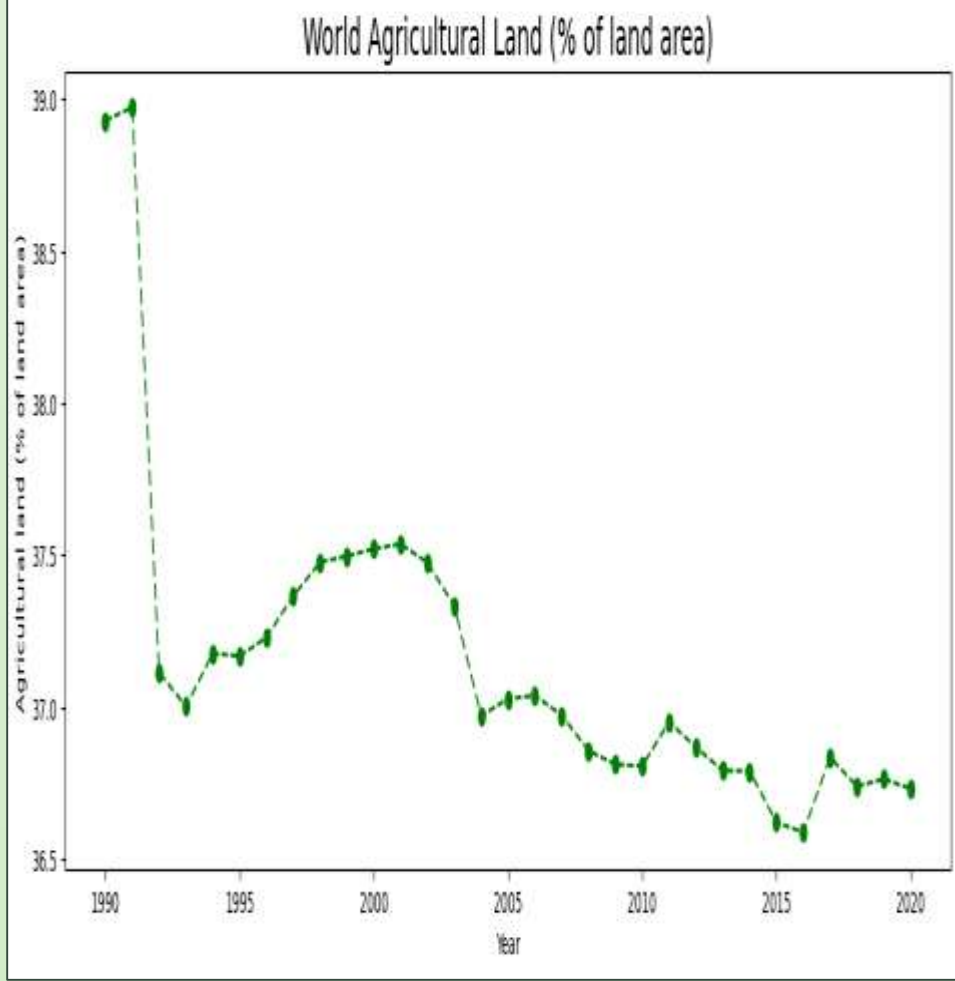
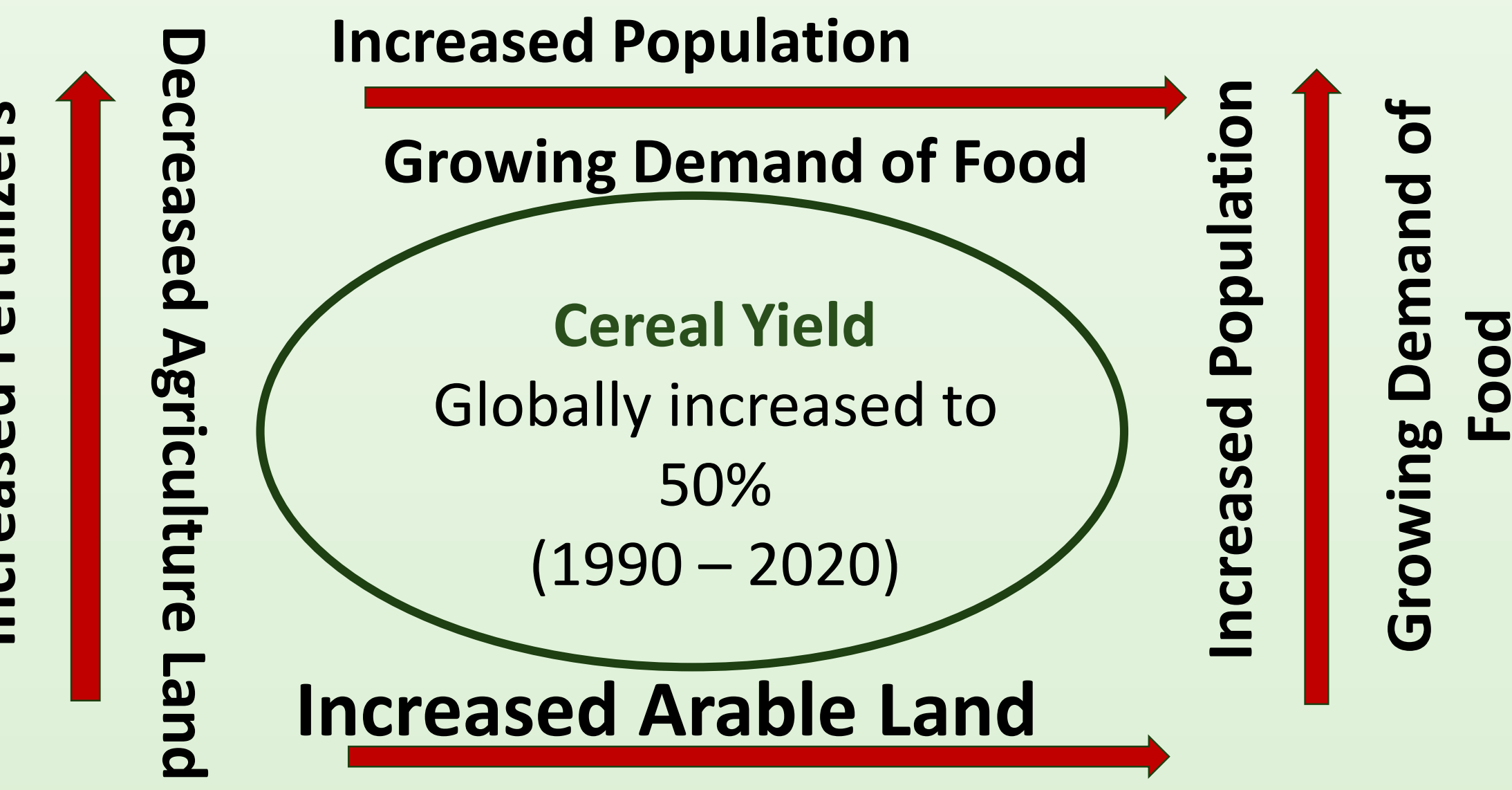
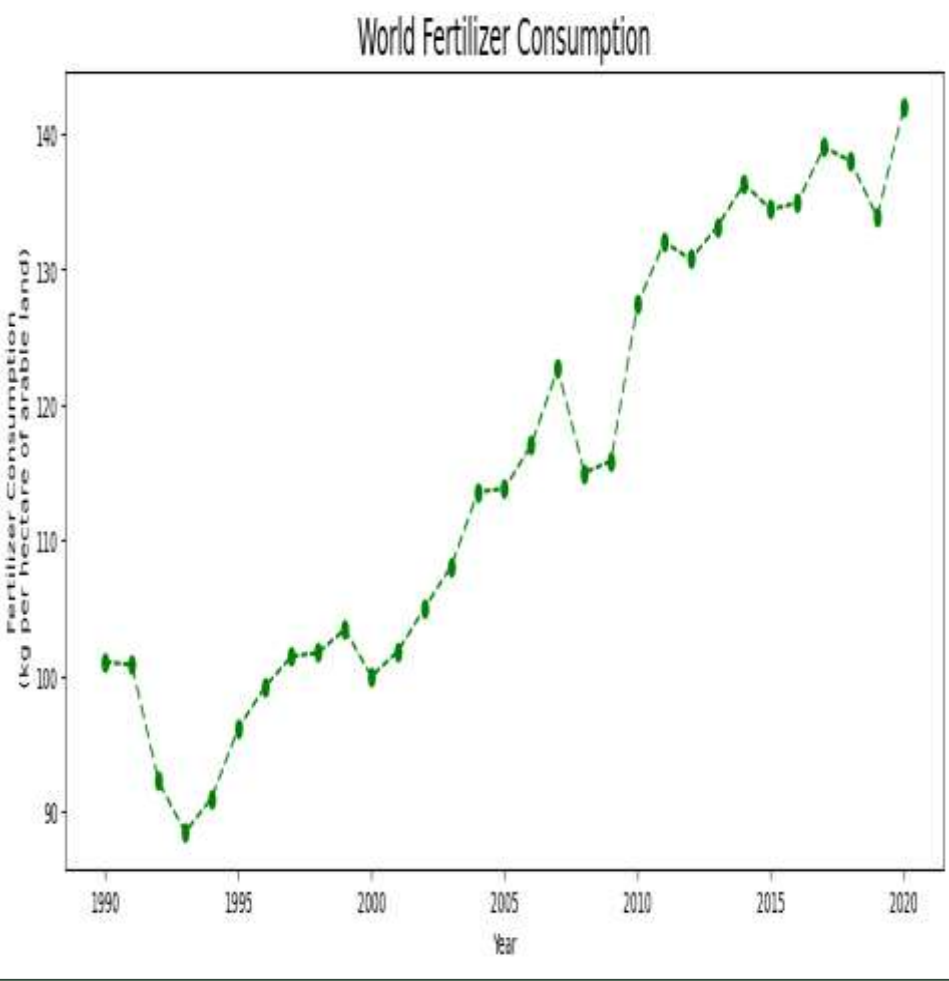
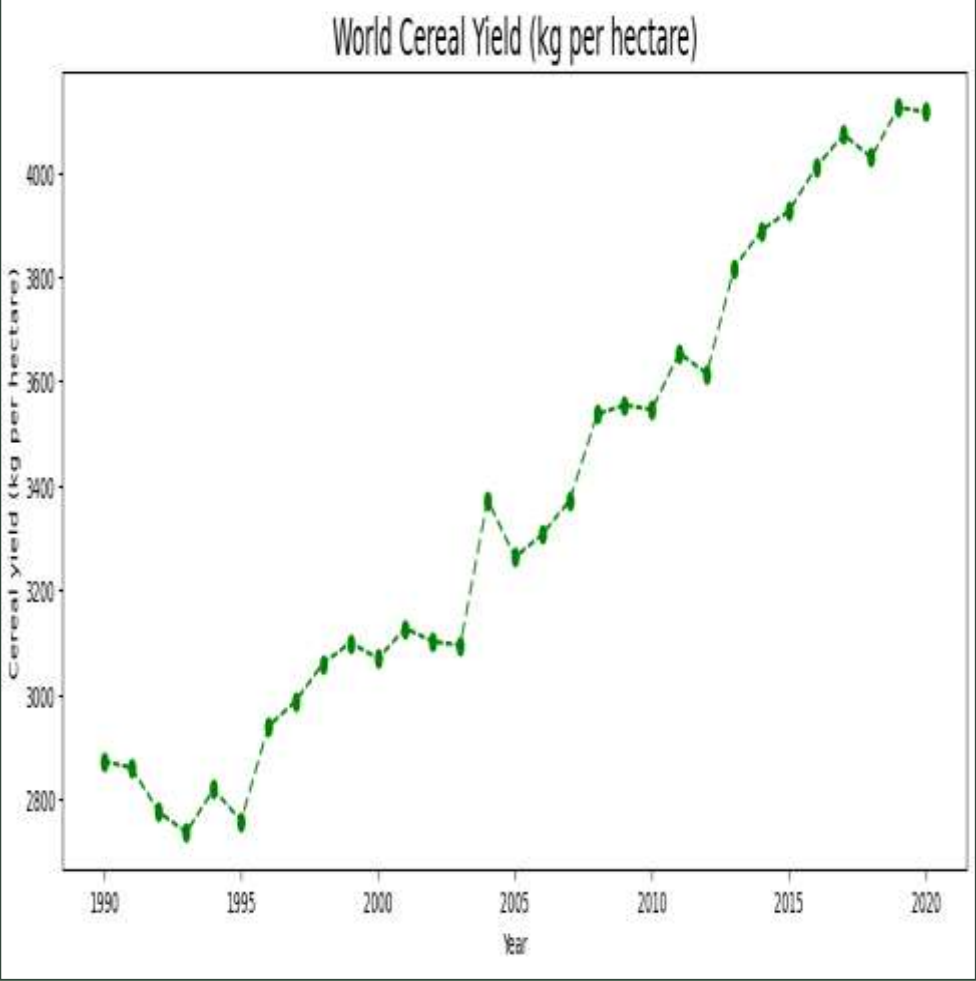
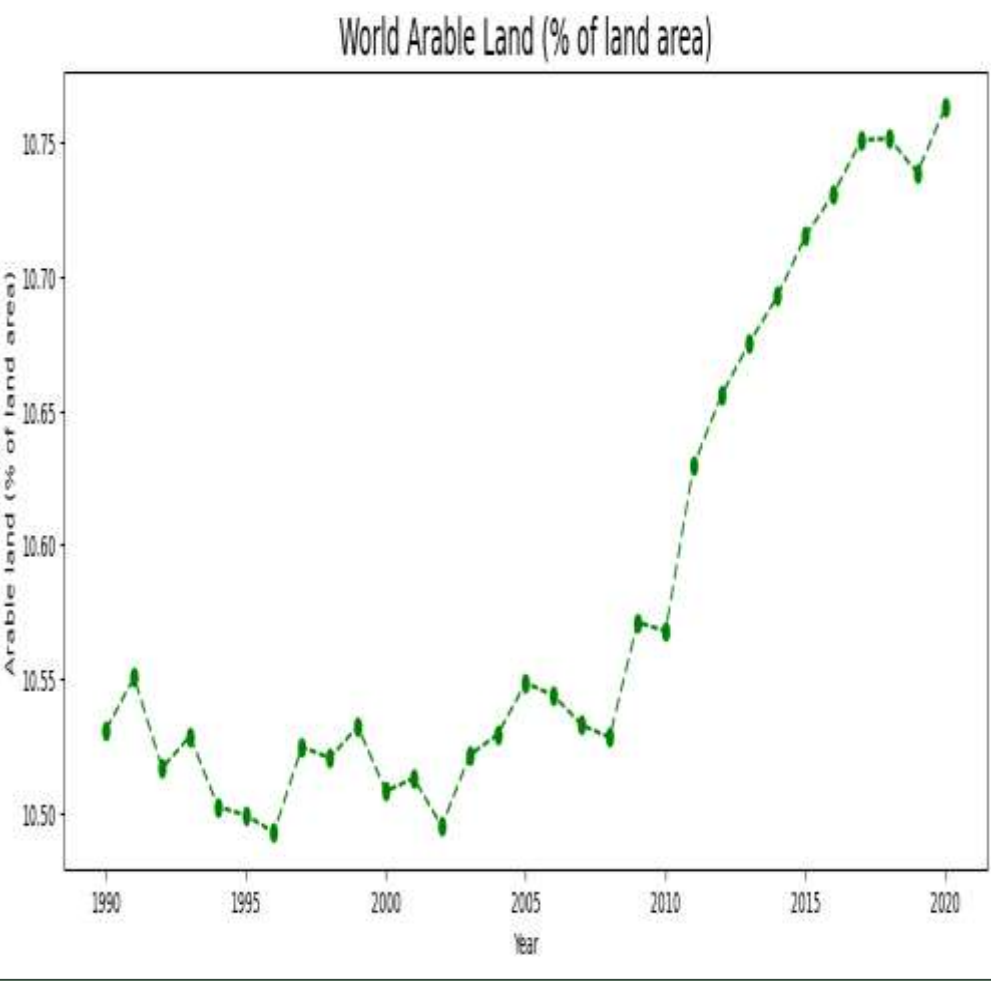


ABSTRACT

The analysis in this study aims to find the influence of various factors on global cereal yield production. The examination of the distribution of arable, and agricultural land, rural population and fertilizer consumption is crucial for shaping agricultural policies and practices. The variability in cereal yield among countries prompts an in-depth exploration of these factors. Clustering can help identify countries with similar land-use patterns and agricultural productivity.

INTRODUCTION

Cereal yield, a key metric in global agriculture, reflects a country's efficiency in crop production. World cereal yield has been increased with the increase in population to meet expanding demand of food. The expansion of arable land and the rapid rise in crop yields have been the driving forces behind the surge in global crop production. Modern agricultural machinery and fertilizer consumption play crucial roles, enhancing efficiency and productivity. Over the years, global trends indicate a shift towards yield improvements rather than the expansion of agricultural land. The decrease in rural population and agricultural land worldwide is due to population growth, and advances in agricultural technology.



RESULTS

Top countries in cereal yield are committed to sustainable agricultural practices. Analysis of Oman (one of the top countries), revealed that more arable land and monitoring and improving crop index, contributes to higher yields. However, the relationship varies among countries, reflecting diverse challenges and opportunities.

Clustering group countries based on similar patterns and characteristics in their cereal production. Cluster of three different types:

Cluster 1: Lowest Cereal Yield

-Adverse climate conditions, inadequate agricultural infrastructure

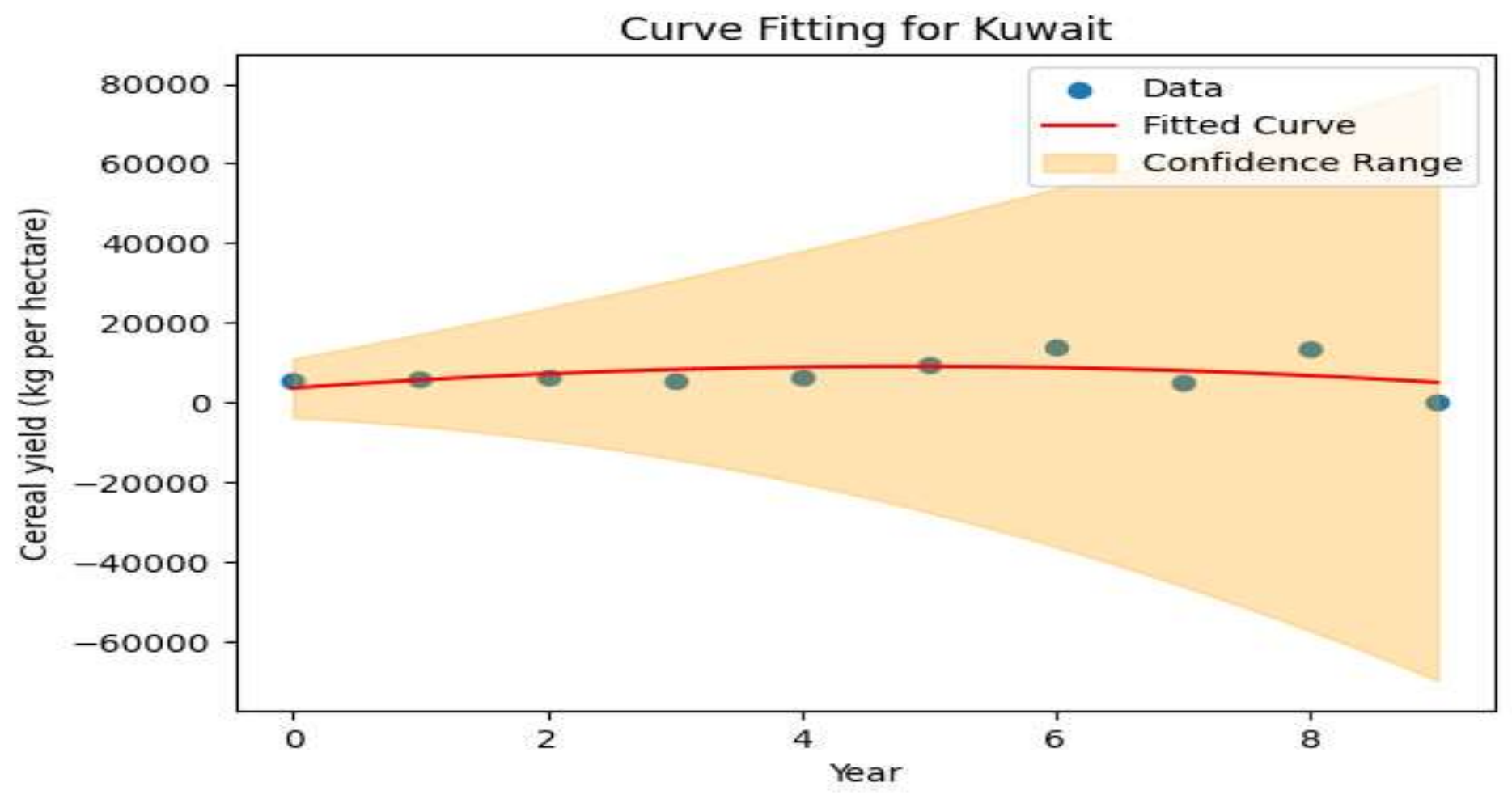
Cluster 2: Moderate Cereal Yield

-Moderate technological adoption, and environmental conditions.

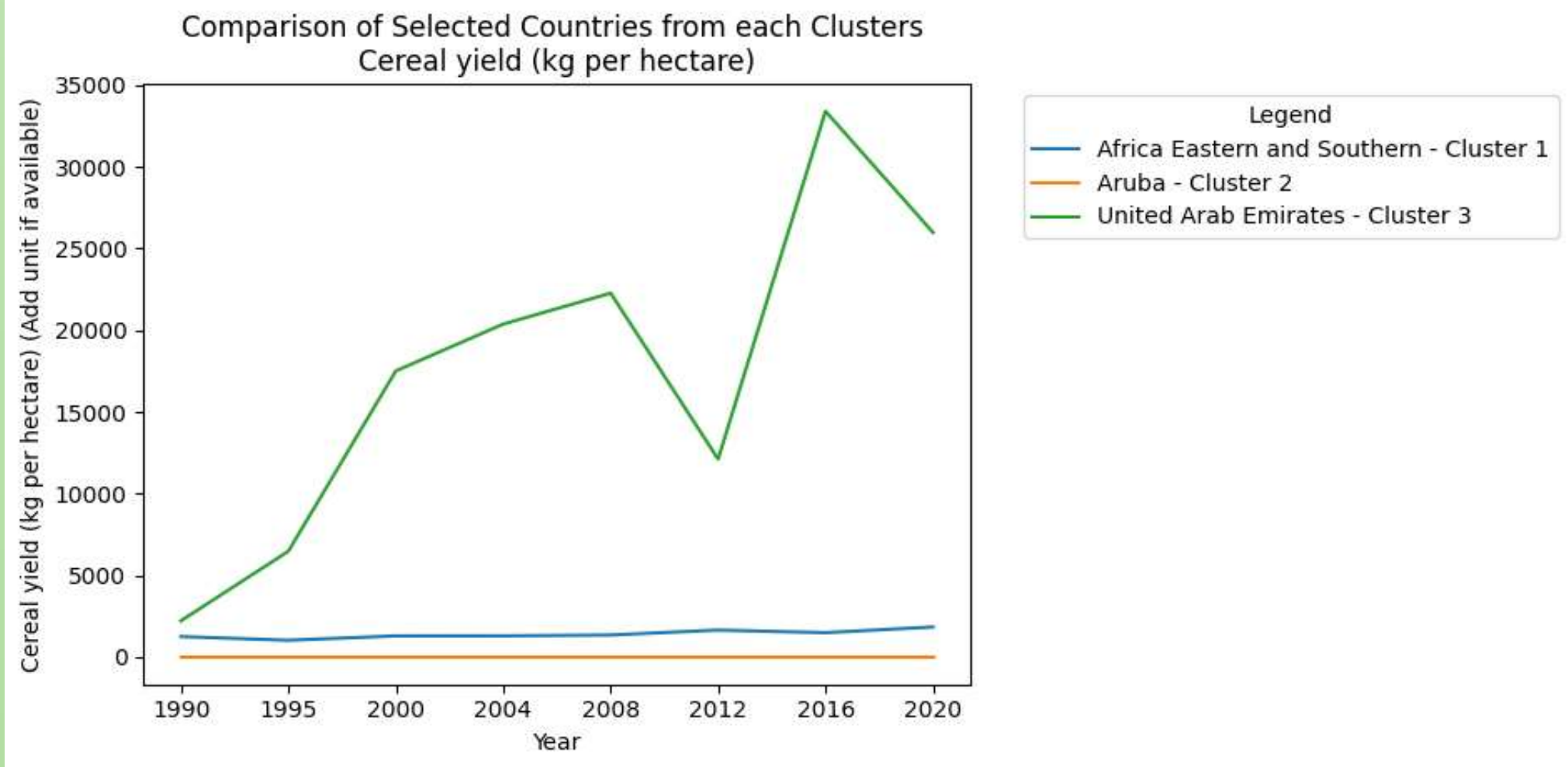
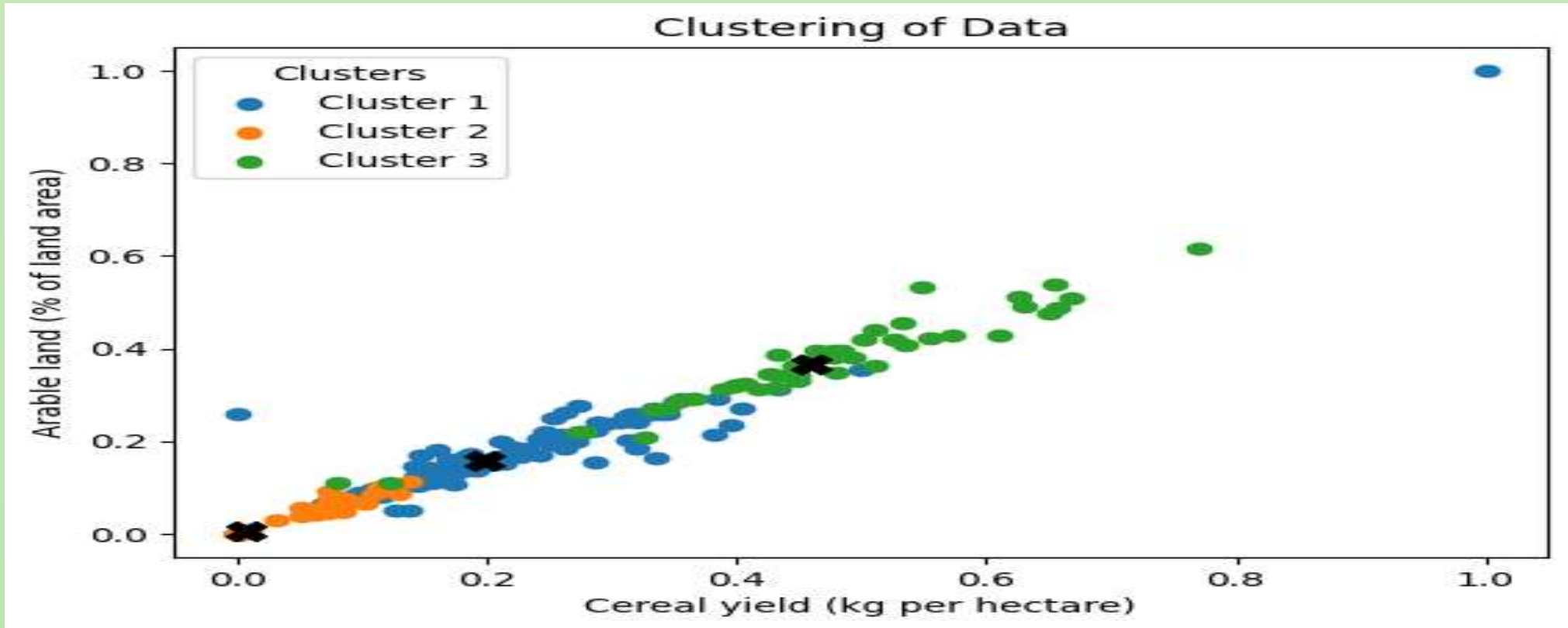
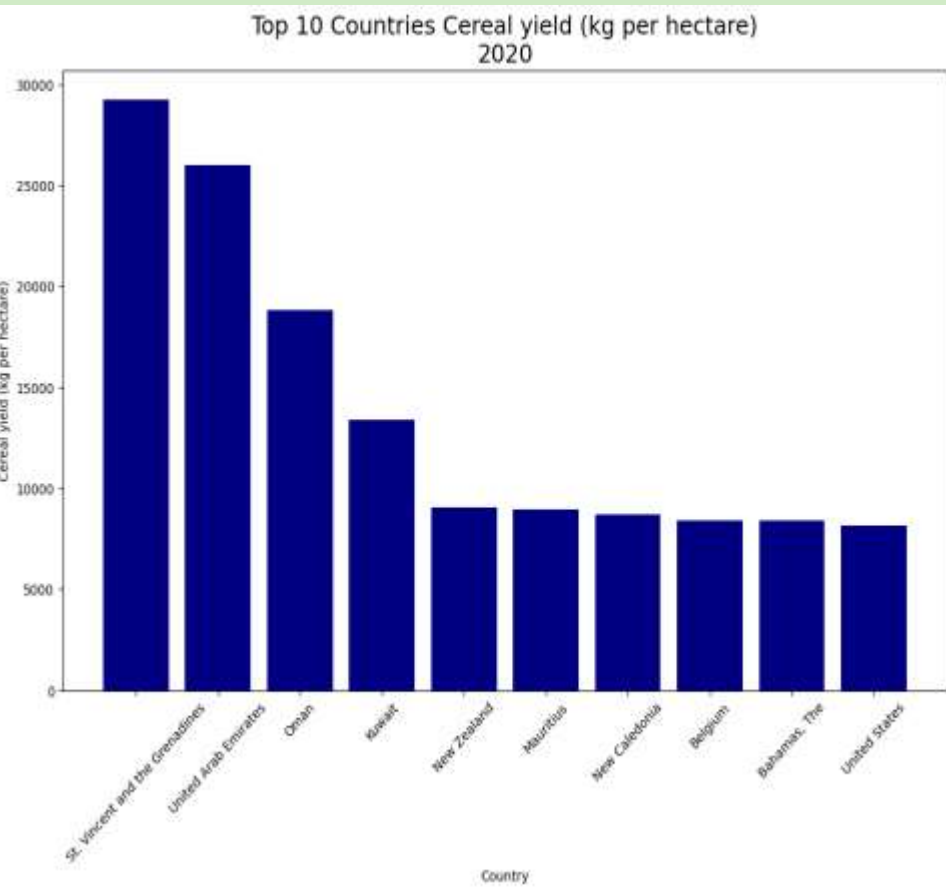
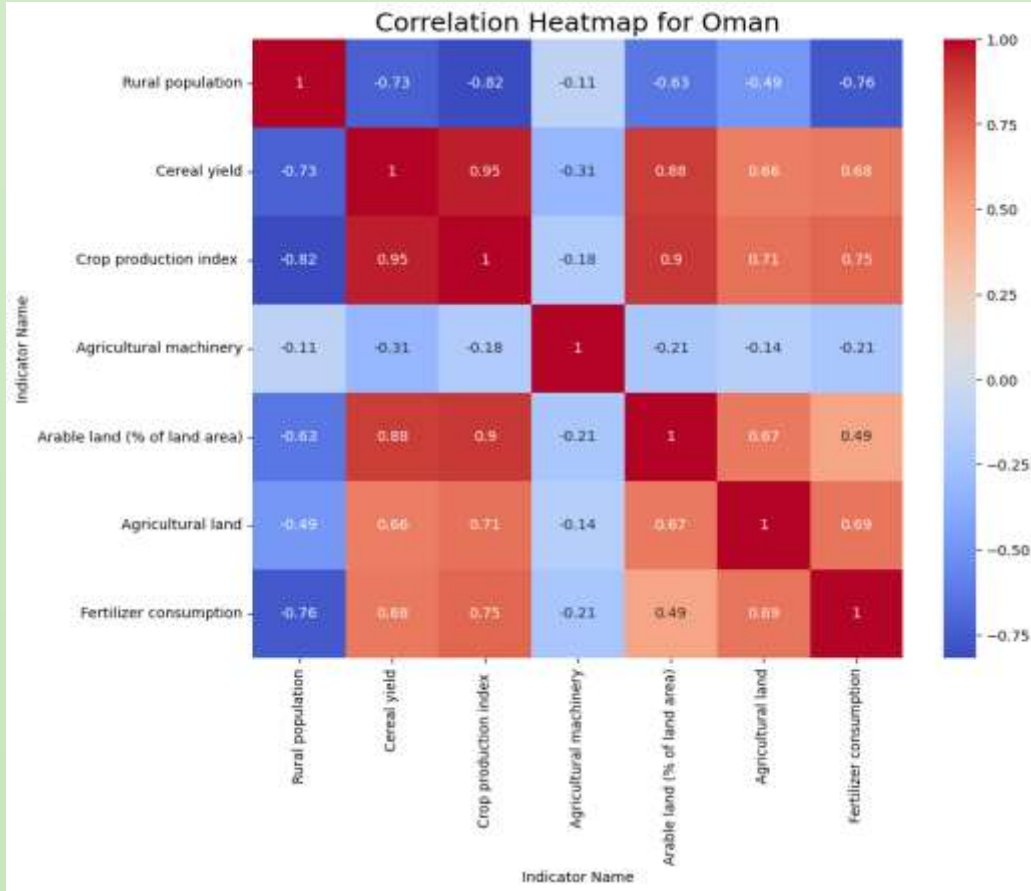
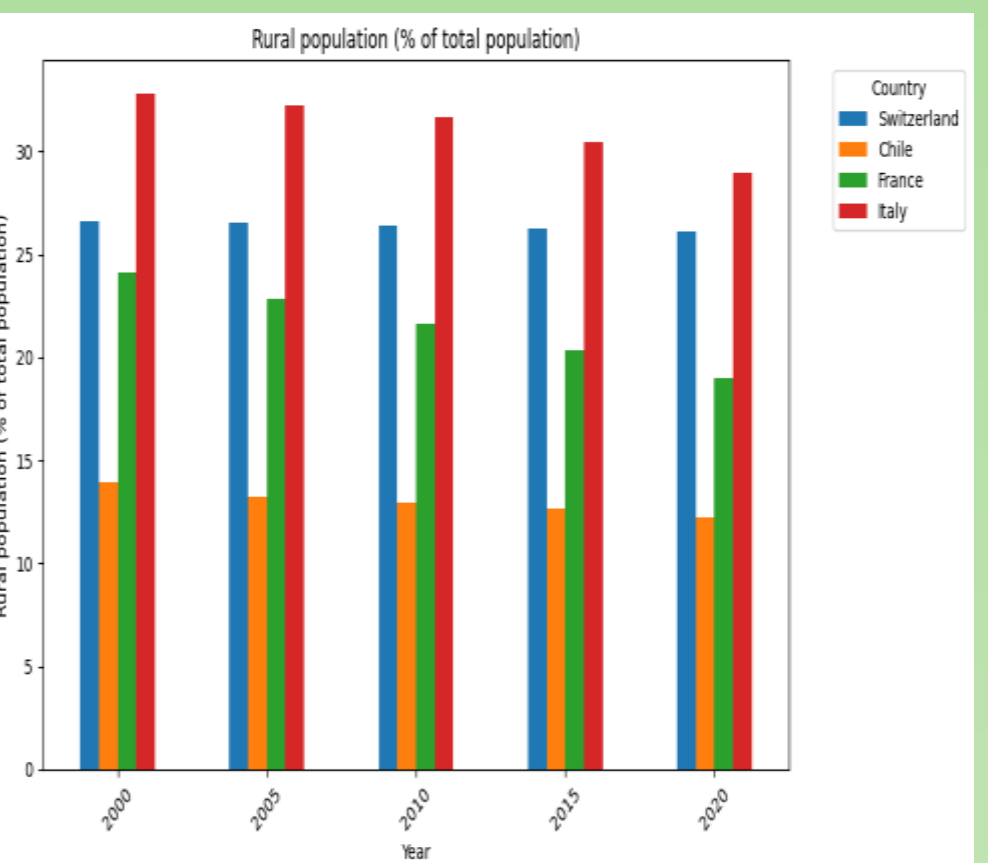
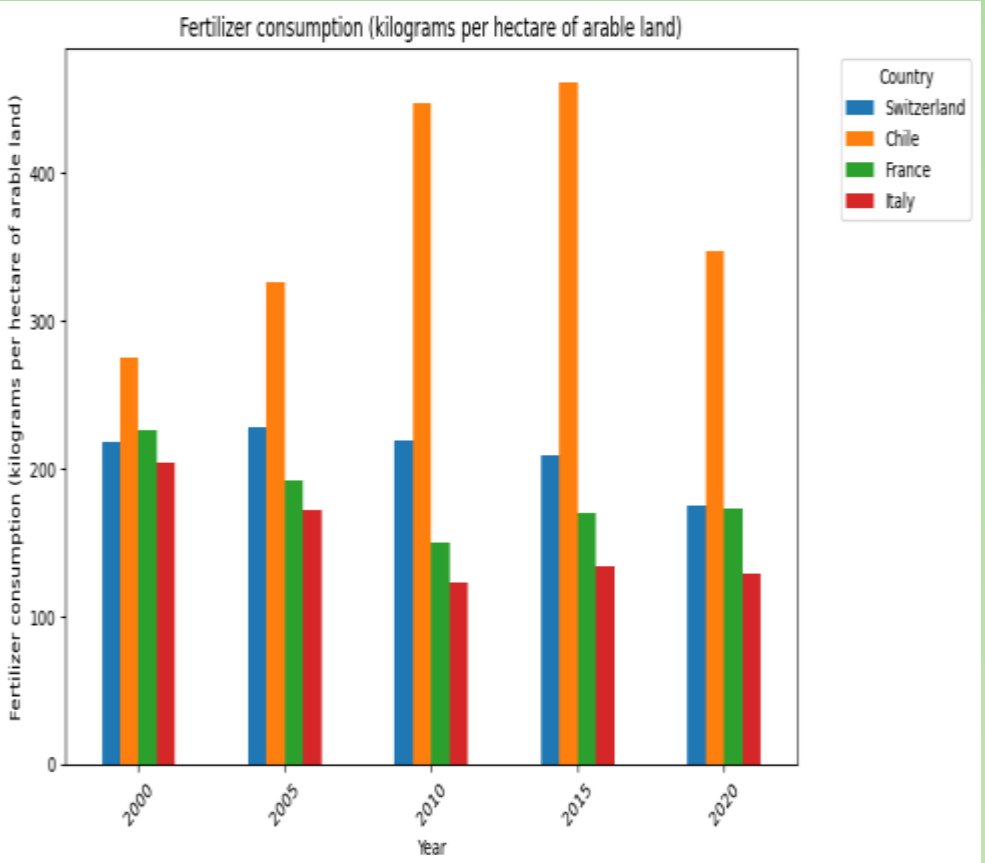
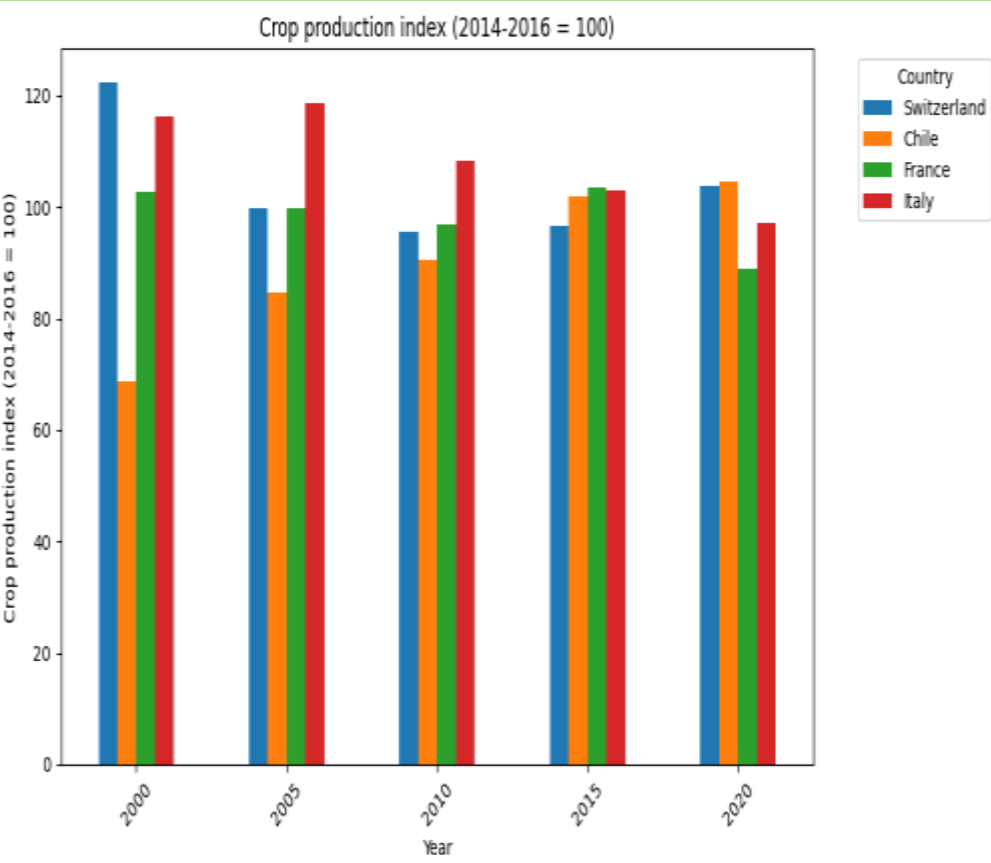
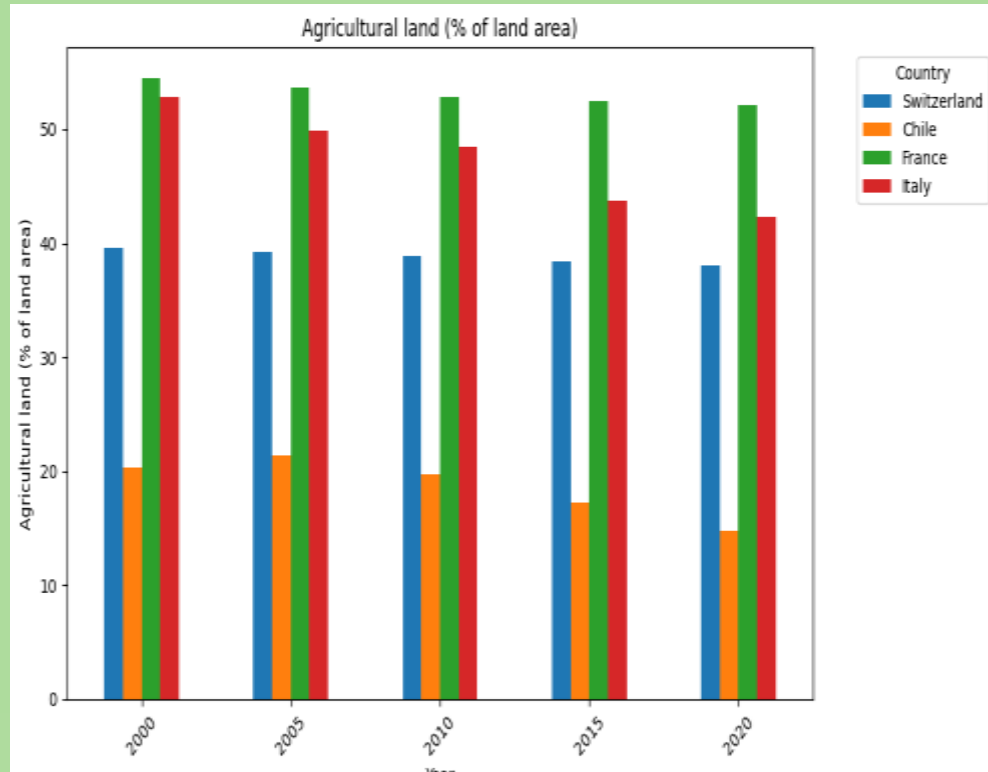
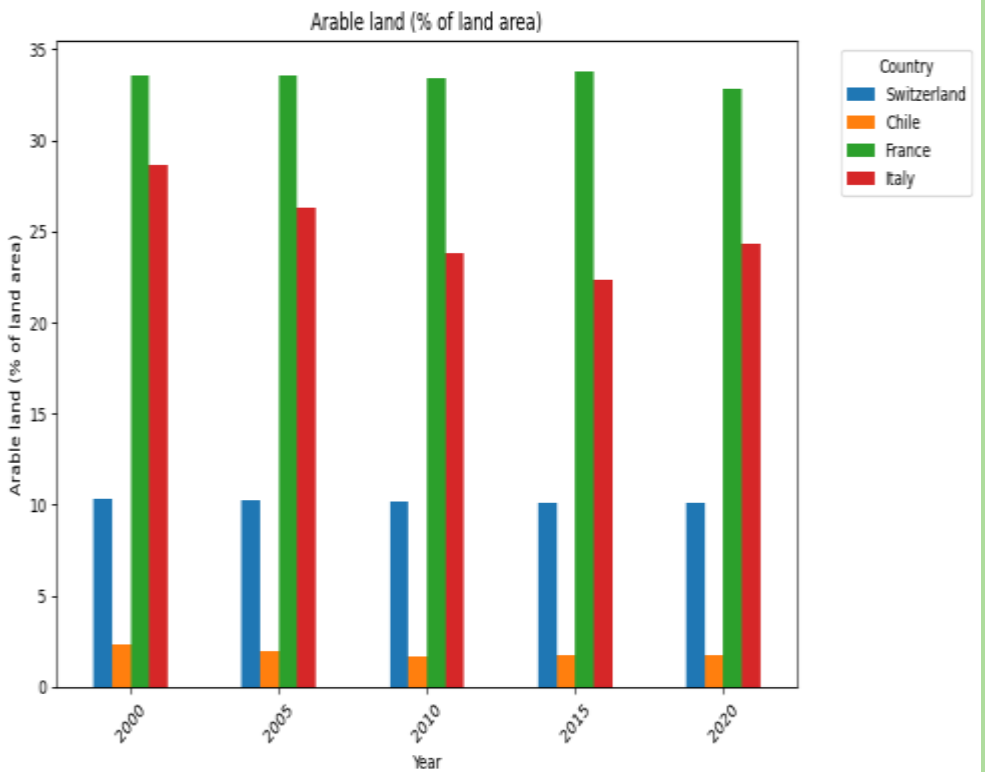
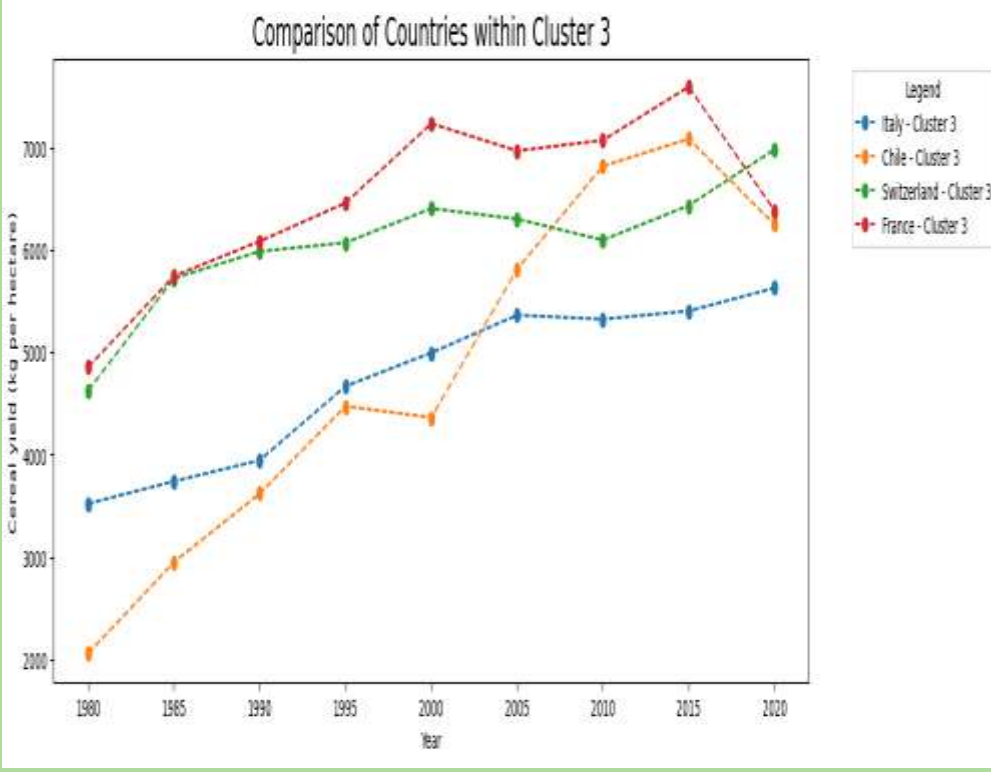
Cluster 3: High Cereal Yield

-Advanced agricultural practices, efficient resource management, and favorable climatic conditions

Countries belonging to low cluster (1) and moderate cluster (2) have similar trend and only minor deviations are observed. High cereal yield country, UAE shows substantial fluctuations over the years due small size of the agricultural sector and the harsh environmental conditions.



Curve fitting and predictions suggest that cereal yields in Kuwait, will potentially decline. Adoption of sustainable agricultural practices are needed.



Analysis of high cereal yield countries highlights the complex relationship between various indicators. i.e., France and Switzerland show similar cereal yield trend. France having more arable and agriculture land, but less fertilizer consumption leads to high cereal yield.

Switzerland, having less arable and agriculture land still improve its crop yield production using innovative techniques such as smart farming. Italy being the second highest in arable, and agriculture land produces less cereal yield as compared to others. However, Chile has improved its yield production by using fertilizers over the years and ranked as second in 2015.

CONCLUSION

Analysis of cereal yield production provides the complex interplay between agricultural factors. Cereal yield production depends on and varies from country to country due to several factors such as climate, agricultural practices. Some countries increase cereal yield production through improvements in yield and the use of modern agricultural technology, others still face challenges in achieving higher yields Clustering countries unveiled distinct patterns and variations.