

PREFACE

Crop loss vulnerability in the agricultural croplands is one of the most prominent natural calamities and disaster, which can be extremely threat for people who are dependent on food crops and for the farmers. The foremost motive and objective of this study was to identify the crop stress so that in future it gets easy for the farmers to take prior precautions of the weak crops, in the district of Agra, Uttar Pradesh, using Geographical Information System (GIS) and Remote Sensing (RS) technologies and Machine Learning Algorithms (MLs), techniques and tools. Numerous parameters were shown to identify the most stress prone regions of the district. For example- Meteorological, Topographical, Edaphological, Bio-Physical. LULC of two years were generated to identify the major changes in the croplands of Agra. Wheat suitability thematic map was also generated by selecting Meteorological, Biophysical and Edaphological parameters to display the relation between stress of the crops and suitability of the crop. The regions which are prone to more crop loss susceptibility are not suitable for wheat production. And finally predictive analysis was done by implementing Random Forest classifier to get more accurate accuracy for the suitability layer.

The crop stress and crop suitability map were thus made, after combining all these parameters in ArcGIS pro. Finally morphometric analysis was done to show the results. This study will help us to get alert of most vulnerable crop stress regions of Agra, Uttar Pradesh and will provide with effective mitigation plantings to the farmers.