

EXECUTIVE SUMMARY

Climate change is one of the most persistent topics in the world today as its effects are far-reaching and long lasting. India, because of its geographical position and population, is expected to be affected a lot by climate change. The mix of anthropogenic pollutants in the atmosphere changes the physiochemical properties of the atmosphere leading to numerous negative impacts. The increased aerosol loads over the Indian subcontinent, globally increasing greenhouse gas (GHG) concentrations, and temperature changes, rainfall, and surface-near radiation are some of them. DST funded project “Climate Change Studies in the Indian Context – A Scientometric Analysis”, is focused to investigate the progress of climate change studies carried out in India and studies associated with the climate change of India conducted globally.

This work is focused to investigate the progress of climate change studies carried out in India and studies associated with the climate change of India conducted globally. The major intention of the study is to conduct a scientometric analysis of climate change studies in India so as to understand the growth pattern of climate change studies in India in the period of 14 years (2005 to 2018). Approved Objectives of the proposal are as follows:

- To examine the growth pattern of climate change studies in India in the period 2005–2018 (14 years).
- To explore the pattern of authorship and collaborative trend.
- To analyse the citation pattern of climate change papers.
- To study the evolution of co-authorship network.
- To map the research topics and study the growth in terms of sub disciplines in climate change studies.

- To visualize the evolution of climate change studies.

The project work commenced on January 20, 2020. The literatures were collected, reviewed and studied to formulate the methodology of the project work. Data for the analysis is extracted from SCOPUS and Web of Science database using a three-term search string composed of different keywords. The documents downloaded from SCOPUS and Web of Science constituted of 37,682 and 22,211 documents respectively, comprising of journal articles, conference papers and review articles related to climate change in India. The primary analysis pointed to some irrelevant articles in the scientific papers retrieved from the bibliometric sources. A manual screening of datasets was done by going through the abstracts, keywords and title to eliminate the irrelevant data from the datasets and increase the accuracy of the analysis.

After the manual screening and removal of duplicates, SCOPUS had 10,504 documents and WoS yielded 6766 documents. The final dataset is generated after the manual screening and merging of two datasets from SCOPUS and WoS in BibExcel software and is used for further analysis. This comes around 17,270 documents and approximately 3400 documents were identified as duplicates in the merged file. After removing the duplicates the total number of documents that is finalised for the analysis is 13,863 in the master file for the analysis. Bibliometric software BibExcel is used for the descriptive analysis and to determine the major scientiometric indicators, while networking tool VOSviewer is used to monitor the co authorship network and visualize the evolution of climate change studies. BibExcel software, and MS Excel software were used to do the performance analysis which includes the identification of growth pattern of climate change studies in India for a period of 14 years. Growth curve of climate change and doubling time of the literature were studied. The pattern of authorship, collaborative coefficient, degree of collaboration and collaboration index were analysed. Identification of productive publishers, productive journals, most prolific author,

most productive organizations, most cited references and most cited documents in the datasets were done. Citation pattern of climate change papers is deliberated using citation analysis. Network Analysis (science mapping) was done for the creation of networks using bibliometric indicators like authors, articles, keywords etc. to reveal the collaboration trend, bibliographic coupling and so on. Network analysis by VOSviewer version 1.6.16 was used to do the network analysis. The major outcomes of the project are listed below.

- The majority of the database constituted about articles (82.75%) and are published in English language.
- Growth curve of climate change literature from 2005 to 2018 was plotted and the doubling time of the literature was found.
- Springer topped the list of top 50 most productive publishers.
- The journal ‘Current Science’ topped the list of most productive journals.
- Majority of the documents received less than 10 citations.
- Kumar, A. of Norwegian University of Life Sciences is the most prolific author.
- There is a dominance of multi authored papers compared to single authored ones.
- Collaborative coefficient, degree of collaboration and collaboration index are tabulated.
- The most influential research area was found as ‘Meteorology & Atmospheric Sciences’.
- Keyword analysis revealed that majority of the keywords obtained from the analysis are related to India.
- Relative Citation Index is maximum for France while for India it is 18.35 against the maximum value of 30.02.

- The analysis of most productive organizations revealed that the Indian Institute of Science, Bangalore, Karnataka, India and Indian Institute of Tropical Meteorology, Pune, India are the most productive institutes with more than 350 records published.
- ‘Increasing Trend of Extreme Rain Events over India in a Warming Environment’ by Goswami BN topped the list of most cited references.
- ‘Impact of irrigation on the South Asian summer monsoon’ by Saeed et al., became the most cited document in the entire datasets.
- Co-authorship analysis, co-occurrence of keywords, bibliographic coupling analysis of documents, authors and countries was done using VOSviewer 1.6.16.
- The clusters were identified and studied and the corresponding overlay visualization and density visualization was also examined.