NEWS AND NOTES

Insights from the Five-day National Training Programme on "Earth Observation Data Analytics for Disaster Management Focusing on Flood and Drought"

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The report presents the prime discussions and insights from the five-day national training programme on "Earth Observation Data Analytics for Disaster Management Focusing on Flood and Drought" organised at the Indian Statistical Institute (ISI) Kolkata from 10-14 July 2023. The Institute of Data Engineering, Analytics and Science Foundation-Technology Innovation Hub (IDEAS-TIH) and the Geoscience and Remote Sensing Society (GRSS), Kolkata Chapter jointly conducted the event. The programme encompassed various disaster risk monitoring and assessment topics, including climate change impacts, extreme weather events, the role of spatial econometrics in disaster studies, and integrating socioeconomic data with Earth observation (EO) data for hydro-meteorological hazard management. The sessions provided valuable insights into the role of Artificial Intelligence (AI), Machine Learning (ML) and open-source web-based geospatial cloud computing platform like the Google Earth Engine (GEE) for disaster management. The importance of near realtime EO data, its impact on decision-making, and challenges related to data complexity were extensively discussed and demonstrated through two keynote addresses, twenty-four lectures and hands-on sessions from national and international institutes. A brainstorming round-table session on "Opportunities and challenges of using EO and socioeconomic data in practice" highlighted the wise use of EO data in disaster management strategies and suggested recommendations for the new data curation to mitigate disasters. Additionally, the launch of GeoHack 23, a problem-solving hackathon with two months duration, inspired five teams with participants from various backgrounds to design innovative solutions using EO data to tackle real-life challenges related to floods and droughts. On 15th September 2023, these teams of GeoHack 23 presented and demonstrated their work in a one-day workshop titled "Unleashing Earth Observation Insights for Flood and Drought Management: Data to Build Resilience". The innovative solutions showcased during the hackathon underscored the potential of collaborative efforts in addressing pressing global challenges and the importance of translational research, which involves applying research findings to real-world solutions.

This training workshop aimed to bring together experts and practitioners from various sectors to explore the most recent methods and approaches for dealing with the complex challenges of drought and flooding. The event served as a forum for people to share their experiences, knowledge, and best practices in dealing with natural disasters and explore approaches to build resilience and reduce vulnerability. The programme gave a vivid description of the geospatial data employed in a broad spectrum of crucial data management applications, spanning military operations, disaster and emergency management, environmental monitoring, and land and city planning. The workshop has highlighted the most recent trends in drought and flood, climate risks and SDGs, innovations, technologies, and the role of EO data for disaster management. The outlook from the training has been prosperous in imparting valuable knowledge, fostering collaboration, and inspiring participants to address real-life challenges in disaster management using EO data analytics. The skills and expertise gained during the programme have the potential to contribute significantly to disaster risk reduction (DRR) and climate resilience efforts in India and beyond. The programme has successfully achieved its objectives of providing participants with a comprehensive understanding of EO data analytics for disaster management. Participants gained insights into weather and climate services, applications of spatial statistics, ML, AI in farmland mapping, and the vitality of advanced cloud analytics platforms like GEE for swift risk assessment and how such tools can be leveraged for DRR. The workshop's hands-on practical sessions allowed participants to apply tools like GEE and geospatial cloud computing, enhancing their understanding and skillset. The interactive and collaborative environment fostered open discussions with experts, encouraging knowledge-sharing and innovative idea exchange. The increasing relevance of geospatial Big Data analytics was discussed to glance through the aspects of data curation, where petabytes of data are being captured through various EO satellites regularly, stored in major global data centre facilities, retrieved and processed in cloud based tech platforms like the GEE. Data shareability, transferability, inteoperability and reproducibility are the prime concerns of present day data management. Data maintenance is necessary to make sure that others can use the exisiting dataset for their ongoing work. This is how we can achieve growth, transformation and newer avenues to research. Therefore, the science of open data and the vitality of data sharing through various digital data repositories were put forward to the participants.

The training programme underlined the importance of collaboration, policy frameworks, and capacity building to effectively manage and mitigate the impact of floods and droughts in India. Participants understood the wide range of remote sensing applications and how it is a crucial and state-of-art technology for leveraging prediction, monitoring, assessment and management of floods and droughts. Moreover, the programme fostered an inter-disciplinary approach, encouraging collaboration and knowledge exchange among participants from diverse disciplines. This highlighted the importance of experts from various fields working together to address the complex challenges of disaster management. Participants gained valuable insights into the pivotal role of policies, such as the National Geospatial Policy 2022 and Indian Space Policy 2023, in bolstering the geospatial sector and facilitating data availability.

The participants were inspired to utilise their expertise to make a meaningful impact in society, working towards minimising the effects of natural disasters, contributing to DRR efforts, and achieving Agenda-2030 in their respective fields. The programme has instilled in them a sense of responsibility and motivation to apply their newfound skills and knowledge for the greater good. One of the key takeaways from the programme is the *importance of interdisciplinary research* in

solving real-life problems. The participants understood the value of collaboration and the potential for engineers, social scientists, professionals, policymakers, disaster managers and researchers from diverse backgrounds to contribute to DRR. The training highlighted translational research, applying research outcomes to practical solutions. This emphasis on practicality and real-world applications further reinforced the participants' understanding of the relevance of their work in addressing existing challenges related to floods and droughts. The constant growth and advancements in space and computing technology, rising variability of high-resolution datasets, and interdisciplinary collaboration are the key pillars of future disaster studies. The participants were equipped with the necessary training and knowledge to contribute to the growing field of EO data analytics for disaster management. Hence, the attendees are expected to develop innovative solutions to address the challenges posed by floods and droughts, ultimately fostering a safer, more resilient, and sustainable future.

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