

From the Desk of the Patron

Prologue

We have addressed the critical challenges faced by the global community by earth processes, global warming, and climate change, and emphasized the remedial measures. “From the Desk of the Patron” is the synoptic and comprehensive explanation of the “Earth System Science Panorama-Section 2” of this issue. This is the compilation and revampification of the earth, climate, and environmental science findings, news, and events aiming at the development of awareness and understanding within the student-teacher community and wider public on crucial and challenging issues. The key findings such as rising global temperatures, severe weather events, resource depletion, and their impacts, melting of polar ice caps, rising sea levels, and disruptions in ecosystems are indeed alarming. It is important to highlight the interconnectedness between these environmental changes and their impacts on biodiversity, as well as the direct effects on human livelihoods and well-being. **The recognition of human activities, such as greenhouse gas emissions, deforestation, and unsustainable practices, are significant contributors to climate change and the environment. Presenting this information in simple language is essential for broadening the understanding of the general public, including students and teachers. Our proposed strategies, include transitioning to renewable energy sources, sustainable land-use practices, biodiversity conservation, and climate-resilient infrastructure, the importance of understanding earth's geological processes for both scientific advancements and addressing challenges posed by natural disasters and resource management. align with our prime goals.**

Our comprehensive overview in ESS Panorama of Section-2 of this issue touches upon crucial aspects like anthropogenic climate change, just transition, climate intersectionality, common but differentiated responsibilities, nature-based solutions, net zero emissions, decarbonization, heat action plans, distributed renewable energy, Loss and damage due to climate change, circular economy and environmental, social, and corporate governance; and various causes of urban flooding. They are worrying concerns for the adaptation of climate-friendly methodology for our survival.

The loss and damage related to climate change particularly emphasizing the vulnerability of developing countries such as India and other countries, are generally observed. The recognition of the unique challenges these nations face, including extreme weather events, underscores the need for urgent adaptation measures. The financial burden associated with climate adaptation, as highlighted by the UNEP's Adaptation Gap Report, is indeed substantial. **Diverse climate finance options are crucial to supporting developing countries in their efforts to adapt and mitigate the impacts of climate change. The concept of historical responsibility and the call for compensation from developed nations to aid developing nations in addressing loss and damage is a significant point of discussion.** The establishment of a loss and damage fund by developed nations signifies a step towards acknowledging this responsibility and providing tangible support. It's essential to continue these discussions, ensuring that practical solutions and financial assistance are made available to vulnerable countries facing the adverse consequences of climate change. COP27 and similar forums play a critical role in shaping global policies and actions to address climate-related challenges and promote sustainable development.

Estimated at approximately 70 billion metric tons, the recent and largest discovery of phosphate in the world has the potential to meet worldwide demands for fertilizers for at least a century, as reported by EURACTIV based on Norge Mining's announcement. Beyond fertilizer production, phosphorous plays a vital role in the manufacturing of solar panels and advanced lithium batteries used in electric vehicles, semiconductors, and computer chips. The newly found deposit, with an estimated 4,500 meters underground extension, surpasses initial expectations. Norge Mining is committed to environmentally sustainable operations, planning to capture carbon emissions and implement greener mining processes. Additionally, the presence of vanadium and titanium within the phosphate deposit has attracted attention from the aerospace and defense industries. **The combination of Norway's phosphate discovery and neighbouring Sweden's recent rare-earth metal discovery is seen as a significant strategic advantage in the geopolitical landscape, particularly in competition with Moscow and Beijing. In conclusion, the massive phosphate discovery in Norway has the potential to reshape global resource dynamics, reinforcing Europe's position in strategic industries and contributing to the transition towards sustainable and advanced technologies.**

The influence of geology on evolution of life for the past 500 million years, Uttarakhand tunnel collapse, revelation of secrets of Gondwanaland by new Trilobite species, mitigation of earthquake and landslide Hazards in the Eastern Himalayan Region, and huge Phosphate deposits in Norway and revolution

in shaping fertilizer and solar cell demand and supply: and creating a new geopolitical landscape, were some important and interesting facts mentioned in the ESS Panorama of this issue.

The comprehensive and forward-thinking approach addressing climate change and environmental challenges are Focus on Mitigation Strategies, People-Centered approach, Empowerment through climate and environment Education, Social Equity and Adaptation, Holistic and Collaborative Effort, Sustainable Practices and Renewable Energy, Vision of a Resilient and Sustainable Future.

In September 2023, Japan launched a pioneering lunar lander, featuring a transforming robot named LEV-2, short for Lunar Excursion Vehicle 2. This innovative robot draws inspiration from children's toys, utilizing shape-changing mechanics to navigate the Moon's terrain. Developed by the Japan Aerospace Exploration Agency (JAXA), LEV-2 is mounted on the Smart Lander for Investigating Moon (SLIM), a collaborative effort with TOMY COMPANY, LTD., Sony Group Corporation, and Doshisha University. All El Niño events are not created under equal conditions. Their impacts vary widely, and satellites like the U.S.-European Sentinel-6 Michael Freilich helped to anticipate those impacts on a global scale by tracking changes in sea surface height in the Pacific Ocean. These conditions can then propagate poleward along the western water that expands as it warms, so sea levels tend to be higher in places with warmer water. El Niños are characterized by higher-than-normal sea levels and warmer-than-average ocean temperatures along the equatorial Pacific coasts of the Americas.

Epilogue

ESS Panorama of this issue covers a wide range of significant earth science-related events and news, showcasing the intersection of geology with various aspects of human life, natural disasters, and global geopolitics. The influence of geology on the evolution of life for the past 500 million years, Uttarakhand tunnel collapse, revelation of secrets of Gondwanaland by new Trilobite species, mitigation of earthquake and landslide Hazards in the Eastern Himalayan Region, and huge Phosphate deposits in Norway and revolution in shaping fertilizer and solar cell demand and supply: and creating a new geopolitical landscape, were some important and interesting facts of this section. Further, they emphasize the importance of geoscientific advancements keeping pace with balancing the global environment with eco-friendly resource management. In conclusion, our discussion encapsulates a holistic and inclusive approach to addressing environmental challenges, recognizing the interconnectedness of human well-being and the health of the planet. This people-centered perspective is essential for creating a sustainable and resilient future.

We have encouraged students, researchers, academicians, and the broader public for contribution of articles on these issues in the greater interest and survival of our community. We wish all success of the Dec. 2023 issue of the journal.

Dr. B. Mishra, Patron
GeoChronicle Panorama