National Workshop on Sequence Stratigraphy and Basin Analysis – Neelam Das, Birbal Sahni Institute of Palaeosciences, 53 University Road, Lucknow - 226 007 (E: d.neelam15@gmail.com)

The Department of Geology, Nagaland University had organized a five day national workshop on “Sequence Stratigraphy and Basin Analysis, at the Kohima Campus in Meriema, Kohima, Nagaland, from 26th to 30th November, 2018. The workshop was organized on the occasion of 25th Anniversary of Nagaland University. The Department of Geology was established in 1983 under the erstwhile North Eastern Hill University and was merged with the Nagaland University in 1994.

The aim of the workshop was to showcase the significance and wide application of sequence stratigraphy in sedimentary basin analysis especially for researchers and assistant professors engaged in the field of teaching and research in sedimentology. Use of sequence stratigraphy in sedimentology has greatly enhanced our understanding of the basin evolution and its lithofills.

The workshop began with the welcome ceremony, held in the lecture hall of Geology Department of Nagaland University on 24th November with addresses by Prof. Pradeshi Lal, Hon'ble Vice Chancellor and Prof. G.T. Thonge, Head of the Geology Department. Around 30 participants including research scholars, assistant professors and scientists from all over India attended this workshop. The workshop included plenary talks by eminent researchers like Prof. Subir Sarkar, Department of Geology, Jadavpur University, Kolkata; Prof. Santanu Banerjee, Department of Earth Sciences, IIT Bombay; Prof. Nagendra Pandey, Department of Earth Sciences, Assam University, Silchar; Prof. R.A.S. Kushwaha, Department of Earth Sciences, Manipur University, Imphal; Prof. B.V. Rao, Department of Geology, Nagaland University, Kohima; Dr. Sandip Kumar Roy, Advisor, CBM, DGH, New Delhi and Dr. S.K. Srivastava, Department of Geology, Nagaland University, Kohima.

The first day of the workshop started with the talk of Prof. Subir Sarkar. He gave a detailed account on “Sedimentary Environment”. He explained sequence stratigraphy as a new outlook in stratigraphic successions, considered as one of the latest conceptual revolutions in the field of sedimentology updating the methodology of stratigraphic analysis. He told us about its wide applications like in deciphering the Earth's geological record of local to global changes in palaeogeography and the sedimentary processes. Further, he talked about how facies analysis is useful in the identification of various sedimentation processes and in reconstruction of ancient sedimentary environments. The next lecture was by Dr. Santanu Banerjee on “Sedimentary Basin and their Classification, Basin Analysis”. He gave a detailed lecture on various mechanisms of basin subsidence, classification of sedimentary basins, sedimentary basin analysis, basin mapping methods and informed us about the important factors like what determines the depth of a rift basin, what is a piggyback basin, what are the different tectonic settings of sedimentary basins and what are basinal ‘highs’ and ‘lows’.

On the second day, Dr. Santanu Banerjee delivered a lecture on “Tectonic classification of the Sedimentary Basin of India” which comprises of different types of basins in different settings like divergent settings, intraplate settings, convergent settings, transform and strike-slip settings and hybrid settings. In his other lecture on “Introduction to Subsidence History Analysis” he talked about how the basins form and how subduction takes place. At the end of his lecture he added that three particular conditions are required for the formation of an oil reservoir i.e. the source rock (rich in organic material must be buried to the appropriate depth), a porous and permeable reservoir rock (required for it to accumulate in) and a cap rock (to prevent it from escaping to the surface). Next lecture was delivered by Dr. Subir

Sarkar on “Principles of Sequence Stratigraphy”. He taught us that principle of sequence stratigraphy offer theoretical guideline that how the facies and time relationships are expected to be under specific circumstances such as subsidence patterns, sediment supply, topographic gradients, etc., and with the type of sedimentary basins these circumstances may also change significantly. The last lecture of the day was delivered by S.K. Srivastava on “Basin Analysis: Lithofills” and discussed what type of lithofills are present in high and in low energy environment. This presentation was based on his own fieldwork in and around Nagaland.

On the third day, the first lecture was on ‘Palaeocurrent Analysis’ delivered by Dr. R.A.S. Kushwaha. He explained the current systems responsible for transportation of sediments often leave records of their movement direction within the sediment and this information can be used to decipher the palaeocurrents, which in turn is used to study directional and other primary properties of sedimentary rocks from which we can reconstruct current system and make a palaeocurrent analysis. The next lecture was delivered by Prof. B.V. Rao, on “Geology, Minerals Resources and Prospects of Mineral Based Industries in Nagaland”. He said that the state has huge caches of unutilized and unexploited mineral resources, with an estimated reserve of 600 million tonnes (2017-2018 NSMDC Report). Despite the state's valuable holdings, the government does not seem too much concerned. According to NSMDC report about 5 million tonnes of proved reserve of nickel and cobalt is present in Nagaland but as exploration is restricted in Nagaland and due to its bulk demand, India is bound to import them from other countries. Platinum is also recently discovered from Nagaland in considerable amount. The last lecture, on the third day, was delivered by Prof. Nagendra Pandey, on “Sedimentary Basins”. His talk comprised of fundamentals and basics of sedimentary basins which is very much helpful in developing the concept for new researchers. He also carried out a practical class for the preparation of lithostratigraphic column.

On the fourth day the last lecture of the workshop was delivered by Dr. Sandip Kumar Roy on ‘Application of Sequence Stratigraphy to Oil Exploration in Indian Sedimentary Basins’ and on “Advances in sequence stratigraphy: Where are we heading to?” According to him sequence stratigraphy as a tool in aiding petroleum exploration is fast gaining credence to the geoscientists. He defined the procedure for sequence stratigraphy, suggested applications of sequence stratigraphy to Indian sedimentary basins in terms of basin types and pointed out the relevance and its importance in the Indian context. Besides, he also took a practical class for the research scholars on how to map unconformities and correlate conformities on seismic data and predicting system tracts/internal strata pattern on seismic data.

The workshop provided an excellent opportunity to the young researchers and scientists. Dr. S.K. Srivastava, the coordinator of the workshop, shared his comments on the workshop and thanked all the participants for their enthusiastic participation. He also thanked DST for the financial support as well as local administration for the success of the workshop.

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