IAG Webinar South and West Asia

Date: 1 March 2021 at 13:00 – 17:00 IST
(8.30-12.30 CET)

Coordinators:
Prof. Sunil Kumar De *(North-Eastern Hill University, India)*
Prof. Adel Sepehr *(Ferdowsi University of Mashhad, Iran)*

13:00 – 13:40 IST INAUGURAL PROGRAMME

13.00-13.10:
Prof. Mauro Soldati (Italy)
President, (IAG)

13.10-13.20
Prof. A. R. Siddiqui (India)
Secretary General, (IGI)

13.20-13.30:
Prof. Sunil Kumar De (India)
Vice President, (IAG)

13.30-13.40:
Prof. Adel Sepehr (Iran)
EC Member, (IAG)

13:50 – 14:20 IST

A personal perspective on my career in planetary geomorphology

I will talk about my career path and reflect upon the factors that brought me into a career in Planetary Geomorphology. I will touch on how being a woman has influenced this path and share my personal view on many of the issues facing many women in academic careers today.

Prof Susan Conway
CNRS, UMR 6112 Laboratoire de Planétologie et Géodynamique
Université de Nantes, France

Prof. Milap Chand Sharma
CSRD,
Jawaharlal Nehru University,
New Delhi, India

14:20 – 14:50 IST

Local Last Glacial Maxima in the Himalaya: Illustrations, and Inadequacy in Reconstruction

The Last Glacial Maximum is long accepted to have terminated at ~18000 years ago elsewhere in the world, but the Himalayan local Last Glacial Maximum still remains illusionary, speculative and contested. Be it the continentality within the mountain range, or the aspect of the valleys and altitudinal control, a varied size of expansion is engraved in the higher Himalayan landscape, having little similarity in timing or magnitude even within this system. The limited number of upper ages determined using variety of techniques across mountain length provide an inadequate and perfunctory chronology, thus generating more contestation and confusion. The topography must have played a considerable influence in restricting expansions at each stage and location from spilling-over the Himalayan Valley, baring stray examples in the frontal region of the Dhauladhar. Although the landform records indicate a large glacial expansion within the major valleys from east to west much earlier than the LGM, yet a robust chronology is awaited for a proper understanding not just of the timing but also of the related climate drivers/cycles of the period in this part of the world, now that accessibility, a limitation in the past, has been made possible through network of highways and newer technologies. Relative role of the regional and topographic control and associated factors for creating such an asynchronous behaviour demand robust and sustained evaluation for a better future modelling of the Global Climate. We will be presenting only the time-constrained field records of the major mountain valleys of the Sikkim, Garhwal, Himachal Himalaya.

Earthquake-driven coastal changes

Globally, coasts are exposed to high vulnerabilities and hazards. The effects of marine and coastal processes on human population were demonstrated by extreme events such as the Indian Ocean Tsunami 2004 or Hurricane Katrina 2005 in the Caribbean. Demographic projections suggest that, globally, almost 1 billion people will live in low-elevation coastal areas by 2030. It is therefore critical to improve our understanding of past littoral hazards, including their driving mechanisms, magnitudes, and frequencies. Earthquakes and tsunamis across the Eastern Mediterranean have resulted in thousands of human victims, just in the last few centuries; since historical times coastal hazards have affected the development of settlements and civilizations and coastal landscape changes. Past earthquakes have resulted in permanent changes in coastal zones through co-seismic vertical displacements, which are evidenced by various markers of sea level exposed above sea level or drowned below sea level.
The lecture focus on case studies of earthquake-driven coastal changes from the eastern Mediterranean, with examples from Greece, Cyprus and Egypt, where impacts of past earthquakes can be traced through geomorphological and geoarchaeological indicators and methods.

14:50 – 15.20 IST

Prof. Niki Evelpidou
Faculty of Geology and Geoenvironment
National and Kapodistrian University of Athens, Greece

Prof. Basanta Raj Adhikari
Civil Engineering Department, Pulchowk Campus, Institute of Engineering, Tribhuvan University, Nepal

15:20 – 15.50 IST

Perturbation of earth surface process by geophysical and meteorological process in the Nepal Himalaya

Nepal Himalaya is one of the seismically active mountain belts in the world with several kilometers of relief and very prone to catastrophic mass failure. The collision between Indian and Eurasian plates resulted numerous tectonic faults and highly deformed rocks, which are responsible for triggering many earthquakes of different scale. High-grade rock weathering and subsequent torrential rainfall are directly related to increase the numerous geo-hazard problems i.e., landslides, debris flow, and floods, etc. The M_w 7.8 Gorkha Earthquake-2015 has ruptured a 150-km long section of the Himalayan décollement and triggered many co-seismic landslides in central Nepal. These landslides are carrying a large volume of sediment to the rivers and are deposited in valleys and foothills of the Himalayas. Several catastrophic valley infills are quite interesting in the Himalayas and urgently needed for gauging and predicting the recovery times of seismically perturbed mountain landscapes. In this context, research on Pokhara valley has suggested that this valley was formed due to catastrophic events in the medieval period. Therefore, tectonic and geomorphic adjustment to several catastrophic aggradation pulses has been ongoing for many centuries in this region. In addition to this, reoccurring earthquakes, cloud bursting and human interventions have negative impacts on the mountainous region.

Palaeoclimate with reference to Cryosphere dynamics in the Changme Khangpu Valley, Sikkim Himalaya

The N-S trending Changme Khangpu (CK) valley in Sikkim Himalaya has been taken to study the palaeoclimate through the proxy of glacial landforms and glacigenic sediment assemblages. The valley lies at the intermediate zone of the South-West Monsoon and North-East retreating Monsoon wind. The present debris-covered CK glacier is terminated at 4810 m a.s.l. that is surrounded by the Phase-IV latero-frontal moraine and an active paraglacial landsystem. The Phase-III hummocky moraines ended at the palaeo-lacustrine sedimentation and was dated to be 31.47 ± 0.15 Ka Cal BP. Chronological analysis of glacio-fluvial archive from a trench in the palaeo-ablation valley indicate towards oscillating nature of humidity from 14.05 ± 0.17 to 3.45 ± 0.06 Ka Cal BP. The Phase II significant glacier advance has left its imprint through the well-defined terminal moraine (stretches from 4740 m a.s.l. to 4540 m a.s.l.) with the ductile deformation of the tills. This study suggests that valley slope derived paraglacial processes inhibited the preservation of primary glacial continuous sedimentation and geomorphic features in such environments.

15:50 – 16.20 IST

Ms. Manasi Debnath
Department of Geography,
North-Eastern Hill University, Shillong, India

Prof. Nurul Islam
Department of Geography & Environment
Jahangirnagar University
Savar, Dhaka, Bangladesh

16:20 – 16.50 IST

Floodplain sedimentation and its impact on agricultural land use dynamics

This study investigated contemporary floodplain sedimentation, interactions between sediment, vegetation, and agricultural land use, and the potential utility for a Bayesian Network Decision Support System (BNDSS) to assist farmers in making better decisions concerning agricultural land use. The research was performed on the Brahmaputra-Jamuna floodplain in Bangladesh. The research employed exploratory data analysis and Bayesian approaches to identify and investigate causal relationships among the variables and so support probabilistic inferences. The study investigated two distinctly different types of monsoonal flood: a *bonna* (an abnormally large flood and a *barsha* (a normal flood). Data on landforms, flood hydraulics, sediment dynamics (suspended sediment concentrations and sediment accumulation rates), and vegetation, rain-fed flooding, land use and farmers knowledge on soil suitability and cropping were collected through field surveys. The results establish how flow and sediment dynamics contrast as a function of landform and demonstrate that the thickness and calibre of deposited sediment strongly influence farmers' decisions on which and how many crops to cultivate on a given plot.

16:50 – 17.00 IST

Prof. Mihai Micu (Romania)
Secretary General (IAG)

INTERNATIONAL GEOMORPHOLOGY WEEK 2021