IAG Webinar South and West Asia

01 March 2023 at 09:00–11:15 UTC

09:00–09:10
Welcome Address

Prof. Sunil Kumar De
(IAG President)

Coordinators:
Prof. Cengiz YILDIRIM *(Istanbul Technical University, Türkiye)*
Dr. Nurul ISLAM *(Jahangirnagar University, Bangladesh)*
Dr. Narges KARIMINEJAD *(Shiraz University, Iran)*
Dr. Sayantan DAS *(Dum Dum Motijheel College, India)*
Dr. Kapil GHOSH *(Diamond Harbour Womens' University, India)*

INTERNATIONAL GEOMORPHOLOGY WEEK 2023

09:10–09:30

Antiquity of Local Last Glacial Maximum in the NW Himalaya

Prof. Milap chand Sharma, Jawaharlal Nehru University (JNU), New Delhi, India

Topographic configuration, dynamic slope and paraglacial process leave very little older event records in the higher Himalaya. To understand spatial and temporal antiquity of the remnant fragmentary landforms, we have tried to piece together the extent and timings of the glacial events, and have built a strong chronology in the major river basins of the Himachal Himalaya, NW India. Since no single technique is possible to zig-saw-fit these events, we have relied heavily on the multiple age determining methods of Optical, Radionuclide and ^{14}C dating in the Upper Chenab, Upper Beas river basins, and the Dhauladhar range foothills. These landforms reveal that the maximum extent of Mega Glacier in this part are many 10s of kilo years older than the Last Glacial Maximum elsewhere, indicating a strong sub-continental and regional control on these events over time and space.

09:30–09:50

Landslides as a natural seismometer: the importance of faulting mechanism and rupture dynamics on the co-seismic landslide distribution characteristics

Dr. Tolga Gorum, Istanbul Technical University, Istanbul, Türkiye

This work highlights how co-seismic landslides are capable of recording earthquake dynamics. Their spatial distribution characteristics may serve as a valuable tool for understanding fault rupture dynamics, propagation, and major asperities' location through surface process response. The common expectation that the abundance of co-seismic landslides decays systematically away from the ruptured master fault requires careful reappraisal, given the possibility of more complex rupture dynamics that may involve stress propagation along different fault segments. Thus, conventional models of earthquake-triggered landslide susceptibility may need revision.

09:50–10:10

The Sundarban Lowlands: A Century of Change in the Abandoned Ganga–Brahmaputra–Meghna Delta, India and Bangladesh

Prof. Sunando Bandyopadhyay, University of Calcutta, Kolkata, India

Governed by dominance of wave, tidal, and fluvial processes, deltas are intrinsically dynamic. The 251 tidal islands of the Sundarban (11,455 km^2) occupy the fluvially abandoned Ganga–Brahmaputra–Meghna Delta, a large part of which is reclaimed from mangroves since 1770. 100-year comparison of maps and images of the Sundarban shows that while erosion of the estuary margins and the sea facing coastline—up to 40 m/yr—continue for decades in its sea-proximal southern islands, intervening channels between its northern islands are degenerating, resulting in land gain. Erosion of the southern Sundarban can be ascribed to deltaic abandonment and shelf bypassing of sediments through a submarine canyon. Accretion of the northern areas in the west, is related to sediment reworking in a floodtide dominated environment, intervened by reclamation efforts. Considering the current trends, planning for the region must integrate the transformations into management and development initiatives.

10:10–10:30

Flood Recurrence Probability Analysis in the Teesta River Basin, Bangladesh

Prof. M. Nazrul Islam, Jahangirnagar University, Dhaka, Bangladesh

Bangladesh is one of the highest ranked flood-prone countries in the world. Historically, higher magnitude floods had occurred, covering 40-60% of the country, which impacted people's lives and livelihood. The Teesta river in northern Bangladesh is taken into consideration for this study. Rainfall data of both upper riparian (West Bengal, Assam and Sikkim in India) and lower riparian (Rangpur in Bangladesh) zones of the Teesta, as well as its water level and discharge data in Bangladesh, have taken into consideration. It is found that 1974, 1988 and 1998 floods have a recurrence probability of 116, 39 and 23 years, respectively. During those years, total annual rainfall in the upper riparian zone exceeded 6400 mm, which works as the main factor of floods. A digital elevation model (DEM) is generated to identify the probable flood prone zones. Total 2,061 km^2 area, which covers 117 administrative units in five districts of the northern Bangladesh, is identified as flood prone zone.

10:30–10:50

Loess geodiversity: a geomorphological perspective

Mohsen Hosseinalizadeh, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran

The geomorphological component of geodiversity is of great importance in the loess areas, mainly in north-east of Iran. In this regard, geodiversity is considered from geomorphological point of view (landform and process). To study this, densely pipe collapsing area at loessial hillslopes (area ~ 500 hac) of Iranian Loess Plateau was selected and then, aerial photograph (1966) and two UAV images (2018 and 2020) were taken. Regarding land use changes in studied time (1966-2020), the spatial and temporal behavior of pipe collapse were studied. Meanwhile, train effects on pipe collapse response were studied as well. The quantitative and qualitative changes of pipe collapse confirmed high geodiversity of geohazard (landforms and process) in loess deposits.

10:50–11:10

Framing conceptual models for mechanism of sediment bypassing at the tidal inlets along the coastal tracts of Maharashtra, India

Prof. Anargha A. Dhorde, Nowrosjee Wadia College, Pune, India

This work attempts at framing mechanisms by which sand is transferred to the downward shoreline at the tidal inlets along the coastal tracts of Maharashtra, India. Four conceptual models are presented based on available literature and field details. The models considered only natural, unstructured inlets. The first model proposes the process of spit elongation, ebb channel extension, and natural reclamation of the bay area. The attributing factors being sea level regression and excessive sedimentation based on past processes. The second model tries to stress mechanism behind the spit extension and inlet migration in the past. The third model is related to the ongoing processes and proposes the mechanism of ebb tidal delta breaching and ebb channel shifts. The last model relates to flood delta formation and bay filling.