

# BANGLADESH



## Sub: IAEGBangladesh National Group Proposal to Organize” ARC 2025 (Asian Regional Conference 2025)” of IAEGBangladesh.

**Date: Aug 10, 2022**

Dear Prof. Faquan Wu,

It's my great pleasure to inform you as a member of IAEGBangladesh National Group, Bangladesh is actively participating in all IAEGBangladesh events & activities since its inception in 2017. Recently Bangladesh National Group have participated and presented papers in the IAEGBangladesh Asian Regional Conference in Katmandu, Nepal (2017), Singapore (2019), European Regional conference in Greece in 2021. Last few years we have organized many national events here in Dhaka. In 2023 we are also planning to join the forthcoming IAEGBangladesh mega event in Chengdu, China. In this connection, with great pleasure, I would like to inform you that the executive committee of “ **Bangladesh National Group** ” in a recent meeting held on the **26<sup>th</sup> July 2022**, decided to submit proposal to the next IAEGBangladesh council meeting (Sept. 2022) to organize ARC 2025 in Bangladesh in association with Nepal Society of Engineering Geologists as one of the Co-organizers with proposed post conference field excursions (“**Padma Bridge en route to UN World Heritage site Sunderbans**” & “**Bangabondhu Karnafully Tunnel**” en route to **world's largest sea beach Cox's Bazar**).

I am planning to participate in the forthcoming IAEGBangladesh council meeting on 14<sup>th</sup> Sept. 2022 and will submit the proposal in favor of Bangladesh National Group.

Bangladesh National Group is a strong candidate for 15th Asian Regional Conference of IAEG due to following reason:

1. In 2018, Bangladesh hosted a major event of IAEG in Dhaka. It was a great event of IAEG Bangladesh national group.
2. In 2017, 2019 Bangladesh actively participated other ARC's organized by different national groups. Bangladesh national group also organized many events individually since it's inception in 2017. During critical pandemic time, we have organized many virtual events. In 2022, IAEG Bangladesh National Group organized another physical national engineering geological event in association with ANSO China, which clearly justify that Bangladesh can host international event successfully.
3. Last few years, Bangladesh Economy is booming with the development of very large mega infrastructure projects including Padma bridge, Bangabondhu Underwater Karnafully river tunnel, Mass rapid transit (MRT) transport system, Matarbari coal based power plant, Rooppur Nuclear power plant, Paira deep sea port and many others in the pipeline. Recently completed "Padma bridge" is an engineering wonder for the whole world and also for the geo-engineering professionals. In addition, last few years Bangladesh has been experiencing many climate related geo-hazards including landslide hazards, floods, earthquake and liquefaction hazards. These geo-hazards are the big challenges for sustainable development of Bangladesh. The loss due to climate hazards is increasing every year. More than one million Rohingya refugees repatriated from Myanmar are now at high risk of landslides & earthquakes in the Ukhiya Teknaf camp area.
5. Every year many people lives and properties are threaten by natural disasters mainly due to landslides, earthquakes and floods and importance of Engineering Geology in the country is not well discussed by concern agencies including policy makers. As a result, still geologists are leading the engineering geological works and such works are merely guided by geological information rather than engineering geological evaluation. Engineering Geological evaluation is a primary pre-requisite for all mega projects of Bangladesh, which clearly justify the importance engineering geology education in Bangladesh.
6. In developing Engineering Geological curriculum in a university, only Engineering group of Jahangirnagar University is playing a vital role in producing young Engineering Geologists/Geological Engineer's for Bangladesh. Only few JU

engineering geological graduates are now working in different ongoing mega projects of Bangladesh (GoB). Other universities of Bangladesh must come forward to develop engineering geological curriculum for future sustainable infrastructure development and managing complexity of the earth processes to be a developed nation by 2041.

Bangladesh is a developing nation and emerging as an “**Asian Tiger**” in terms of economic growth. As the country’s economy is booming, recently country status has been updated by United Nations from a least developed to developing country with significant increase of GDP and per capital income. Importance of Geological Engineering is huge in this transitional phase of economy to attain sustainability. That’s why Bangladesh is a strong candidate to organize ARC 2025 in Bangladesh.

The major theme of this proposed “**ARC 2025**” will be

## **"Geological Engineering for Sustainable Development"**

### **Supported by:**

International Association for Engineering Geology and the Environment (IAEG)

### **Organized by:**

IAEG\_Bangladesh National Group

### **Proposed Co-Organizers:**

Nepal Society Of Engineering Geologists (NSEG)

Engineering Geology, Geohazards & Disaster Sciences Research Group,

Department of Geological Sciences, Jahangirnagar University, Bangladesh]

Kagawa University, Japan,

ANSO (Alliance of International Science Organizations), China

### **Proposed Sponsors :**

Geological Survey of Bangladesh,

Ministry of Energy and Mineral Resources, GoB.

Ministry of Environment, GoB.

Ministry of Disaster Management and Relief,

Ministry of Science & Technology

Ministry of Education &

Other companies

**Conference date :**

**Nov. 27-28, 2025 (Planned only)** but it will be within last week of Nov 2025 to early December, 2025 (will be finalized later avoiding the date of major national events & festival)

**Conference venue :**

**InterContinental Hotel (Sheraton Hotel) or Pan Pacific Sonargaon Hotel, Dhaka, Bangladesh (5 Star Hotels) with full facilities of arranging International Conference events.**

**Conference size :**

About 250 to 300 attendees, 50 from neighboring countries including Nepal , India and 50 from other counties including Japan, Europe & others.

**Conference language:**

English

**Field Excursions:**

We will conduct two field excursion programs as listed below

1. **“Padma Bridge en route to UNESCO World Heritage site Sunderbans”**

This field trip will start from the capital city Dhaka via Mawa Jazira express highway and will be ended in the coastal mangrove forest of Bangladesh –a UNESCO world heritage site located at Sundarbans, Khulna. Padma Bridge is an engineering wonder to all geo-engineering professionals and landmark of Bangladesh.

Padma Bridge is a multipurpose structure carrying a highway, railway, and utilities, including a gas pipe line and telecommunications cables. The two level structure of the bridge enables the road, railway and utilities to be arranged in a logical manner with good access for maintenance and inspection. The bridge is also provided with emergency access points in order to facilitate the evacuation of a train on the bridge. This is a two-level structure with the highway running on the top concrete slab and the railway running between the chords of the truss. Padma Bridge is a multipurpose structure carrying a highway, railway, and utilities, including a gas pipeline and telecommunications cables. The two level structure of the bridge enables the road, railway and utilities tube arranged in a logical manner with good access for maintenance and inspection. The bridge is also provided with emergency access points in order to facilitate the evacuation of a train on the bridge. This is a two-level structure with the highway running on the top concrete slab and the railway running between the chords of the truss.

1.40 lakh cubic meters of water can go to the Bay of Bengal every second through the Padma. The amount of water that flows into the Bay of Bengal through the Padma is the second highest in the world after the Amazon River.

The length of Padma bridge piles is 120-128 meters. During the monsoon, when there is excess flow, the Padma River may scour 65 meters of soil, which means 65 meters of soil is washed away from the bottom of the river. In the history of bridge construction, the foundation of a bridge has never been built at such a depth anywhere in the world. Special cranes and hammers were made from Germany only for the Padma Bridge for installing such high-length piles.

The piles below the two piers are slightly different, which are vertical bored concrete piles that are up to 80 meters deep. It means that these piles are not inclined but straight underwater. These are concrete piles, like the common columns of our houses. These piles are cast into the water, which means pouring concrete into the water. But the concrete does not float and becomes a column.

The Padma Bridge can withstand an earthquake of 9 on the Richter scale without any complications. Base isolation technology and pendulum bearing is used. Each heavy bearing between the span and pier of Padma Bridge has a weight of about 10,500 metric tons. No other bridge in the world has ever used such heavy bearings.

River training was another very important function of the Padma Bridge, which was very challenging. A 14 km area has come under river training. Placing stones, concrete blocks, and geo bags on the banks of the river. 8.5 lakh tons of stone were used at the Mawa end, and 30 lakh tons of stone were thrown at the Jazeera end. 3,907,500 geo bags weighing 800 kg and 17,267,500 geo bags weighing 125 kg were dropped. The total of cement concrete blocks was 13,301,248.

The first ballast-less rail track is made with RCC instead of stone. The rail track is placed on a truss structure (the V-shaped steel structure). The train will pass through the steel structure. The rail line is dual gauge. It has provision for double-decker containers to carry goods. There will be emergency arrangements so that people can be alighted from the train and taken to a safe place in case of any kind of trouble on the train.

Padma Bridge is a symbol of self-reliance, courage, determination, ability, and confidence. The construction of this Padma bridge is an 'engineering wonder' in front of the whole world, an example of overcoming engineering challenges.

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**Sundarbans** is a mangrove area in the delta formed by the confluence of the Padma, Brahmaputra, and Meghna Rivers in the Bay of Bengal which is enlisted as a UNESCO World Heritage Site. It is the mangrove-dominated Ganges Delta which is a complex ecosystem comprising one of the three largest single tracts of mangrove forests in the world. The Sundarbans mangrove forest covers an area of about 10,000 km<sup>2</sup>, of which forests in Bangladesh extend over 6,017 km<sup>2</sup> and in India extend over 4,260 km<sup>2</sup> and it is occupied by water bodies in the forms of rivers, canals, and creeks of width varying from a few meters to several kilometers. It is intersected by a complex network of tidal waterways, mudflats, and small islands of salt-tolerant mangrove forests. The interconnected network of waterways makes almost every corner of the forest accessible by boat. Rivers in the Sundarbans are meeting places of salt water and freshwater. Thus, it is a region of transition between the freshwater of the rivers originating from the Ganges and the saline water of the Bay of Bengal.

The Sundarban is one of the largest single populations of Royal Bengal [Tigers](#) in one area. The most abundant tree species are sundari (*Heritiera fomes*) and gewa (*Excoecaria agallocha*). The forests provide habitat to 453 fauna wildlife, including 290 birds, 120 fishes, 42 mammals, 35 reptiles, and eight amphibian species. The Mangroves species present in the Sundarbans area serve a crucial function as a protective barrier for the millions of inhabitants in and around Khulna and Mongla against the floods that result from the cyclones. It also protects from tsunamis and soil erosion for the coastal population.

Geologically, the tract of the Sundarbans is of recent origin, raised by the deposition of sediments formed due to soil erosion in the Himalayas. The process has been accelerated by tides from the sea face. The substratum consists mainly of Quaternary Era sediments, sand and silt mixed with marine salt deposits and clay. Soils of the Sundarbans differ from other inland soils in that they are subjected to the effects of salinity and waterlogging. In places soils are semi-solid and poorly consolidated; medium textured, sandy loam, silt loam or clay loam; the grain size distribution is highly variable. Silt loam is dominant textural class. Organic matter content varies between 4% and 10% in dry soil.

The Katka, Hiron Point (Nilkamal), Dublar Char and Tiger Point (Kachi Khali) are the most attractive spots for their beautiful landscape and wildlife and beach. The other attraction of the island is the fishing and honey collecting activities.



Photo: Engineering Landmark Padma Bridge & Mangrove forest Sundarbans ---an UNESCO World Heritage Site.

## **2. “Bangabondhu Karnaphuli Tunnel” en route to world’s largest Sandy sea beach Cox’s Bazar.**

This field trip will start from Dhaka to the the port city of Chattogram, passing through the newly constructed marvelous geo-engineering structure the 9.39 Km. long Karnaphuli Tunnel and ends at the longest unbroken sandy Sea beach of the world, Cox’s Bazar. The

Karnaphuli Tunnel is a game changer for the southeast region of Bangladesh, presenting a solution to connectivity issues to the rest of the country.

Cox's Bazar coast, running from Cox's Bazar to Teknaf, is known as the longest natural sandy beach in the world with an unbroken length of 155 km. It has a low coastal plain leaving behind Tertiary hills with different geological exposures. The sand at Cox's Bazar beach and surrounding areas are rich in mineral content. It is one of the most popular and developed tourist destinations in Bangladesh. The area surrounding the beach contains different geological exposures as well as homes to nearly 8,000 different species of flora and fauna. The magnificent blue water of the Bay of Bengal holds abundant sea life creatures, including jellyfish, starfish, numerous fish species, turtles, and tiny red crabs. At Cox's Bazar city lots of geo-exposures to be observed at Inani and Himchari along the marine drive by the side of the world's longest natural sandy beach with its exposed strata and coastal erosion.



Photo:: Karnaphuli Tunnel and the longest unbroken sandy Sea beach of the world, Cox's Bazar, Bangladesh.

In this circumstances, I would like to Place our strong candidacy to the council to host "ARC 2025 (15<sup>th</sup> ARC)" (Asian Regional Conference 2025) of IAEG" in Bangladesh to enhance IAEG activities in the south Asian region and to promote Engineering Geology activities in the developing nations including Bangladesh. . I am very sure that IAEG council will consider our proposal in the fourth coming council meeting and will approve our proposal very seriously and select Bangladesh – **“The Emerging Tiger of Asia”** as most



suitable country to host **ARC 2025 (Asian Regional Conference 2025) of IAEG.**

Thanking You,

Yours Sincerely,



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**cc. 1. Vice President. IAEG Asia.(Dr.Tang Halming & Dr.Bo An Jang)**