

6<sup>th</sup>

SONEUK  
CONFERENCE

Programme  
Schedule



## Engineering Challenges and Opportunities: Post COVID-19

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Saturday 10<sup>th</sup> July

9:30 am - 5:00 pm

Venue - Zoom

*Please register to receive a link for the event*

# Programme



9:30 - 10:00 Registration and Networking

## **Inaugral / Opening Session**

Session Chair : Sanyukta Shrestha, Chairperson - SONEUK

10:00 - 10:10 **Welcome and Introduction**  
*Dr Bidur Ghimire, General Secretary, SONEUK*

10:10 - 10:25 **Inauguration/Opening, Proceeding unveiling and speech**  
*Lok Darshan Regmi, HE Nepalese Ambassador to the UK*

10:25 - 10:30 **Introduction to the Conference**  
*Narad Bhandari, Vice-chairperson and Coordinator, SONEUK Conference Committee*

10:30 - 10:35 **NRNUK and collaboration with SONEUK**  
*NRNUK President/Representative*

10:35 - 10:40 **Special Guest Speech**  
*Nicola Telcik, President, Engineers Australia UK Chapter*

10:40 - 10:45 **Vote of thanks**  
*Sanyukta Shrestha, Chairperson, SONEUK*

10:45- 10:55 **Short Break**

## **Technical session 1**

Session Chair: Prof Keshav Dahal, University of the West of Scotland

10:55 - 11:15 **Keynote Speech - Water sufficiency assessment for risk-informed water infrastructure development in the post COVID-19**  
*Prof Vishnu Pandey, Institute of Engineering, TU, Nepal*

11:15 - 11:45 **Potential of natural fibres and their composites for South Asian countries: Moving towards sustainability**  
*Prof Hom Nath Dhakal, University of Portsmouth University, UK*

11:45 - 12:15 **Lessons from the Covid-19 Pandemic and the future of workplace**  
*Nathan Gregory and Dr Deepak GC, Kingston University, UK*

12:15 - 12:45 **Essence of Multidisciplinary Effort for Sustainable Development: Lessons Learnt from Covid-19 Pandemic**  
*Dr Rishi Ram Parajuli, University of Bristol, UK*

12:45 - 12:50 **Guest Speech - Climate Change Impact on Water Resources: Global Perspective**  
*Dr Anil Mishra, France*

12:50 - 12:55 **Guest Speech – ICE, UK and Professional Membership & Registration**  
*Malcolm Peake, Membership Development Officer, ICE, UK*

12:55 - 13:00 **Technical Session 1 wrap up and closing by Chair**  
*Prof Keshav Dahal, University of the West of Scotland*

# Programme

Continued



13:00 - 13:30 Lunch Break

## Technical session 2

Session Chair: Prof Hom Nath Dhakal, University of Portsmouth

- 13:30 - 13:45 **Keynote Speech – IT/Computing**  
*Allen Bailochan Tuladhar, Microsoft Country Director, Nepal*
- 13:45 - 14:15 **Sustainable Management of Construction Materials in Post Covid-19: Sand and Gravel Mining from local Rivers in Nepal**  
*Dr Raj Kapur Shah, Liverpool John Moores University, UK*
- 14:15 - 14:45 **Himalayan Glacial Lakes Volume and Potential Glacial Lake Outburst Flood (GLOF) Discharge Calculation**  
*Shiva Sedai, University of East London, UK*
- 14:45 - 14:50 **Guest Speech – American Society of Nepalese Engineers Introduction and Collaboration with SONEUK**  
*Thakur Dhakal, ASNEng, USA*
- 14:50 - 15:00 Short Break
- 15:00 - 15:15 **Keynote Speech – Experiences in Highway Projects**  
*Pawan Karki, Senior Transport Specialist, Asian Development Bank*
- 15:15 - 15:45 **Air Return Strategies and Airborne SARS-CoV-2**  
*Dr Prateek M. Shrestha and Dr Jason W. DeGraw, Oak Ridge National Laboratory, USA*
- 15:45 - 16:15 **COVID-19 impacts on energy systems in Nepal: Implications for SDGs**  
*Dr Ramhari Poudyal, Swansea University, UK*
- 16:15 - 16:45 **Change Management and Introduction of LPE Facilitator(s) within Process, Departmental and Organisational level**  
*Mohammad Z. Ansari, University of the West of England, Bristol, UK*
- 16:45 - 16:50 **Technical Session 2 wrap up and closing by Chair**  
*Prof Hom Nath Dhakal, University of Portsmouth*
- 16:50 - 17:00 Conference Closing

# Keynote Speech



## Water sufficiency assessment for risk-informed water infrastructure development in the post COVID-19

*Prof Vishnu Pandey, Institute of Engineering, TU, Nepal*

Prof Vishnu Pandey is a Civil Engineer and specializes in the areas of hydrology, water resources, groundwater, climate change impacts, and adaptation. He is currently a Professor (Water Resources) in Pulchowk Campus, Institute of Engineering, Tribhuvan University, Nepal. Before joining University, he was with Nepal Office of International Water Management Institute (IWMI) as Water & Climate Specialist. There are over 80 publications to his credit, 54 of them are peer-reviewed papers in international journals. He is a recipient of various awards and recognitions including Young Scientist Award from Nepal Academy of Science and Technology (NAST). He is also serving as a Governing Board Member of Nepal Engineering Council (NEC).



## IT/Computing

*Allen Bailochan Tuladhar, Microsoft Country Director, Nepal*

Allen Bailochan Tuladhar is the CEO of Unlimited Technology that hosts Microsoft Innovation Center in Nepal. He has also served in the High-Level Commission for Information Technology, chaired by the Prime Minister of Nepal, General Secretary of Computer Association of Nepal and a member of SAARC Chamber of Commerce. Mr. Tuladhar has also driven partnerships with various development sector organizations, such as UNICEF, UNDP, WWF, WFP and UNDP to promote technology, entrepreneurship and youth mobilization. He is also Microsoft Regional Director, bringing about digital transformation with the adoption of emerging technologies such as the cloud and mobile.



## Experiences in Highway Projects

*Pawan Karki, Senior Transport Specialist, Asian Development Bank*

Pawan Karki is a Chartered Engineer from the ICE, UK and a certified Project Manager (IPMA). He is currently station in ADB's Uzbekistan Resident Mission as Senior Transport Specialist. Before joining ADB in 2015, Pawan worked for 29 years as Representatives for executing agencies, contractors and supervising engineer for consulting firms on construction sites. Worked in 14 countries as well worked as a ADB Consultant, Client's Representative, Contractor for Crown Agents Kier JV (UK), and with various International Companies as Team Leader/Project Manager since 1986.



# Technical Presentations

## Potential of natural fibres and their composites for South Asian countries: Moving towards sustainability

*Prof Hom Nath Dhakal, University of Portsmouth, UK and*

*Dr Sikiru Oluwarotimi Ismail, University of Hertfordshire, UK*

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Increased environmental concerns and depletion of petroleum-based resources arising from the use of non-renewable resources have increased the demand of natural fibre reinforced composites (NFRCs). Composite materials reinforced with glass and carbon fibres have limited end-of-life (EoL) options, which is a major concern. To minimise this situation, lignocellulose plant fibres have been studied extensively in recent years, due to the increasing demand for sustainable, lightweight and environmentally friendly materials. Natural plant fibres are considered as a viable substitute to E-glass fibres owing to their many attractive benefits, such as biodegradable, recyclability, high specific strength and stiffness suitable as reinforcements for many semi-structural and structural composite applications. This new class of lightweight sustainable composites can offer environmental, social and economic benefits as substitute materials for various applications. Through an up-to-date review, this work presents an overview of natural plant fibres as reinforcements of composites for various applications, especially in the context of the South Asian countries.

## Lessons from the COVID-19 Pandemic and the future of workplace

*Nathan Gregory and Dr Deepak GC, Kingston University, UK*

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The recent COVID-19 pandemic has shown just how quickly the way we live and the way we work can change. High-rise office buildings and state of the art headquarters emptied of employees overnight. Leaving many of the office's comforts behind, not just the ability to separate work from home but many of the security measures business had in places were no longer available. Security layers such as CCTV, secure internet connections, on-site security, and security doors just to name a few, all left behind to be replaced by a laptop and a kitchen table. With such a quick and large-scale move to remote working, it is easy to forget and miss weak points in our "new office" security and it is important to analyse and learn from them. At the end of 2020, we conducted a survey to find the answers to three questions related to remote working during the pandemic, the cybersecurity methods to mitigate any vulnerabilities, and areas that had been left exposed. This will be further discussed, analysed and new measures on cybersecurity will be presented in this paper.

# Technical Presentations

## Essence of Multidisciplinary Effort for Sustainable Development: Lessons Learnt from COVID-19 Pandemic

*Kusum Sharma, Research and Innovation Department, Science Hub, Nepal and  
Dr Rishi Ram Parajuli, University of Bristol*

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COVID-19 pandemic that has been spreading all over the world after it originated from China in late 2019, claimed millions of lives. It has not only changed the daily lifestyles, perceptions, and behaviour but also has been a benchmark to tackle the biological disaster along with other recurrent disaster events through a multidisciplinary approach. This paper briefly presents the multidisciplinary efforts on developing a risk assessment tool during the pandemic and the scenario of research and practice in engineering disciplines to follow in the future for resilient and sustainable development.

## Sustainable Management of Construction Materials in Post COVID-19: Sand and Gravel Mining from local Rivers in Nepal

*Dr Raj Kapur Shah, Liverpool John Moores University, UK and  
Dr Madhav Prasad Koirala, Pokhara University, Nepal*

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Sand and gravel extracted from local rivers are the commonly used natural materials for the buildings and infrastructure projects globally. The demand of such materials is increasing intensely due to the boom in the construction industry and to reactivate the national economy post COVID-19. Local rivers are the main source of construction materials in developing and developed countries including Nepal. Inconsistent and unregulated mining of rivers' sand and gravel have caused adverse impact on environment, economy and society. The unsustainable practices remain largely unaddressed by local stakeholders and the existing sand mining policy in Nepal. Hence, the paper focuses on examining the impacts caused by rivers' sand mining on environment and local community and recommending the potential mitigation measures. The research is based on the exploratory approach followed by comprehensive literature review, and quantitative data collection via field survey around Chure Hills where majoring of rivers used for sand mining in Nepal. The observations at sand mining sites and views from local stakeholders were collected using a questionnaire survey, and Excel was used to analyse the research data and summarise the survey findings. The survey found that the existing sand mining policy in Nepal has a negative impact and a need of a new policy to reduce the impact on environment and local community livelihoods including loss of farmlands and woodlands, land erosion, flooding, health hazard with dust and noise pollution, and local economy. The paper concludes that local stakeholders including local government must be made accountable for sustainable use of the rivers' extracted materials and protect the local environment and communities by designing a new sand mining policy.

# Technical Presentations

## Himalayan Glacial Lakes Volume and Potential Glacial Lake Outburst Flood (GLOF) Discharge Calculation

*Shiva Sedai, Dr Ravindra Jayaratne and Dr Jaya Nepal, University of East London, UK*

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This research investigates historical glacial lake outburst flood (GLOF) events at the Hindu Kush Himalaya region (Nepal) and analyse the empirical relationship between lake volume and outburst peak discharge calculation. Several formulae already exist that relate lake area and volume from different parts of the world, which warrants further analysis to implement this research scenario at Himalayan glacial lakes. Due to the variation of geographical terrain and other various factors, ice and moraine-dammed glacial lakes often have different geometries and, therefore, different volumes. There are few investigations conducted at different parts of the world (Patagonia, Chile, Swiss Alps) based on the measured volume (by a field investigation and other means) of the lakes. This research aims to improve the volume estimation formula based on empirical evidence in different research scenario (Himalayan glacial lakes). This research has analysed the historic outburst details from Himalaya region, Nepal, and derived the empirical formula to calculate lake volume and potential discharge of GLOF of the glacial lake in the Hindu Kush Himalaya Region, Nepal.

## Air Return Strategies and Airborne SARS-CoV-2

*Dr Prateek M. Shrestha and*

*Dr Jason W. DeGraw, Oak Ridge National Laboratory, USA*

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Ducted air return for heating, ventilating and air-conditioning (HVAC) systems is sometimes claimed to be a superior technique over plenum return strategies from the viewpoint of exposure to airborne pathogens. While both the return strategies have advantages, there is limited evidence in the literature as to which strategy is superior with respect to a building's vulnerability to airborne pathogens. This paper describes multizonal airborne contaminant dispersion modelling using CONTAM software Version 3.2 to simulate the overall building vulnerability to airborne SARS-CoV-2 aerosols when released in an office building and evaluates the two air return strategies. Results showed that for ducted returns, maintaining negative pressure in the release zone coupled with 100% outdoor air supply can greatly reduce overall building vulnerability. However, for a building maintained under a slight positive pressure and a recirculated air percentage as low as 31%, ducted return does not necessarily outperform plenum return in terms of overall vulnerability to airborne pathogens. Building-specific details and factors that are not easily represented with multizone modelling are important, making general preferential statements for either strategy difficult to make. Insights from this study can guide new construction and retrofits of buildings both during and after the COVID-19 pandemic with the aim of safe re-occupancy of buildings while keeping the buildings resilient against potential future events.

# Technical Presentations

## COVID-19 impacts on energy systems in Nepal: Implications for SDGs

*Dr Ramhari Poudyal, Swansea University, UK*

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The COVID-19 pandemic has caused severe interruption to the energy sector, leaving impacts that will be felt for years to come. Nepal is also one of the signatory countries of the 2030 agenda for Sustainable Development Goals (SDG). The world faces enormous challenges to provide resilient electricity to their 30 million people under goal 7.1 universal access to affordable, reliable and modern energy service. Furthermore, the government follows the UN's 2030 Agenda for Sustainable Development with the robust national commitment to transformative change in the country through its integrated approach and the principle of 'Leaving no one behind'. However, multidimensional poverty, structural challenges of the economy, complicated geophysical features, and fragile environmental situations continue to pose severe challenges for promoting rapid, inclusive, equitable, and sustainable development of the energy sector in Nepal. This article reflects the impact of COVID-19 on the energy sector in Nepal and the implication for the SDGs. That weakened global cooperation reducing the chance of fast-tracking and streamlining the low-carbon transition worldwide. First, the researcher analysed the worldwide impact and linked and compared it with Nepal's results in detail. Nepal will need US\$20.25 billion to meet different SDGs. This research focused on literature, observation, and data analysis from various sources. After reviewing the progress, the researcher concluded that the overall development was affected by the COVID-19 pandemic, creating additional problems in achieving the SDGs target. According to the cost estimates, US\$5.39 billion a year was insufficient.

## Change Management and Introduction of LPE Facilitator(s) within Process, Departmental and Organisational level

*Mohammad Z. Ansari, Dr. Lisa Brodie and Marilyn Goh, University of the West of England, UK*

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Change facilitators are individuals who utilize change philosophy to make a positive change to organizations. The application of change facilitators can be seen in various change models; Lewin, Lippitt, etc. The facilitators within numerous change models are considered as internal/external consultants. Whilst most of the scholarly papers consider change facilitation as a consensus attempt to improve organization, there is a need to develop a clear link between both the organization and the change facilitator for creating a self-sustaining change environment. This research paper's aim is to introduce the development of wheel-on-wheel concept by considering change Leaders, Planners, and Executers (LPE), at various organizational levels (Process, Departmental, and



# Technical Presentations

Organisational). The concept of LPE is derived by exploring interrelated characteristics between facilitator(s) and the organizational through qualitative research for understanding change management techniques and facilitator(s) behavioural aspect from existing Change Management models and Organisation behaviour works of literature. The introduced LPE concept (i.e. Wheel-on-wheel concept) assists in highlighting and identifying the roles and responsibilities of change team to successfully deliver the change initiative within any organization(s).

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