

GANGA CONNECT

JOURNEY OF GANGA REJUVENATION

08-25
NOVEMBER
2021

UK EXHIBITION & OUTREACH

GLASGOW | CARDIFF | BIRMINGHAM | OXFORD | LONDON

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सत्यमेव जयते

भारत का उच्चायोग, लंदन
High Commission of India
London, United Kingdom



National Mission for Clean Ganga
Ministry of Jal Shakti
Government of India



cGanga
Centre for Ganga River Basin Management and Studies
Indian Institute of Technology, Kanpur

National Mission for Clean Ganga (NMCG)

NMCG is the implementation wing of National Ganga Council which was setup in October 2016 under the River Ganga Authority order 2016. Initially NMCG was registered as a society on 12th August 2011 under the Societies Registration Act 1860. It acted as implementation arm of National Ganga River Basin Authority (NGRBA) which was constituted under the provisions of the Environment (Protection) Act (EPA) 1986. NGRBA has since been dissolved with effect from the 7th October 2016, consequent to constitution of National Council for Rejuvenation, Protection and Management of River Ganga (referred to as National Ganga Council).

www.nmcg.in

Centre for Ganga River Basin Management and Studies (cGanga)

cGanga is a think tank formed under the aegis of NMCG, and one of its stated objectives is to make India a world leader in river and water science. The Centre is headquartered at IIT Kanpur and has representation from most leading science and technological institutes of the country. cGanga's mandate is to serve as think-tank in implementation and dynamic evolution of Ganga River Basin Management Plan (GRBMP) prepared by the Consortium of 7 IITs. In addition to this it is also responsible for introducing new technologies, innovations and solutions into India.

www.cganga.org

Acknowledgment

This document is a collective effort of a number of experts, institutions and organisations in particular, Centre for Ganga River Basin Management and Studies (cGanga), Indian High Commission, London, UK and National Mission for Clean Ganga, Ministry of Jal Shakti, Government of India. A special thanks also to all the partner organisations as well as members of Ganga Connect-Chapters in the UK involved in delivering the exhibition.

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गजेन्द्र सिंह शेखावत
Gajendra Singh Shekhawat



जल शक्ति मंत्री
भारत सरकार
Minister for Jal Shakti
Government of India

Message



In the last few years, the National Mission for Clean Ganga under the aegis of Ministry of Jal Shakti has conducted numerous national and international events to showcase the Namami Gange programme. However, the one international outreach and showcase activity that we are particularly proud of is the Ganga Connect exhibition that was organized from 08-25 November 2021 across five cities in the UK.

To engage with international technical experts, scientific community, technology companies and investors is fairly normal for any Government department to deliver major programmes such as the Namami Gange initiative. But to also be able to engage the diaspora community in such a way that they become brand ambassadors and champions of the programme is very unique

and an exemplary approach.

The exhibition was able to generate significant interest and plant the seed for numerous partnerships in times to come. Of particular importance are the various Ganga Connect chapters that have been set up across the UK in Scotland, Wales, Midlands and the Greater London area. Through these our engagement with the diaspora will remain concurrent and grow in the following years.

Scientists and universities were able to ideate on high impact collaborative projects, technology companies were able to understand the significant size and the opportunity the Namami Gange programme offers them to launch their solutions in India, and investors were able to engage in a very meaningful way to find out about more investment opportunities as well as appreciate the level of innovation that the programme is bringing through by way of alternative finance instruments such as river impact bonds that score very highly on the ESG index.

Credit must also go to three different agencies that came together in a very unique way to implement the programme over a two-week period. The High Commission of India, despite the complexities of the COVID pandemic, was able to organize both partnerships and logistics in five different cities. cGanga (Centre for Ganga River Basin Management and Studies) organized the entire intellectual component of engaging with all the varied stakeholders by organizing more than 15 strategic roundtables, and NMCG (National Mission for Clean Ganga) delivered on a highly engaging exhibition content that left the visitors in much awe of the programme.

With the inaugural Ganga Connect exhibition in the UK we have set a precedent with a very high bar, but one that our diaspora communities and international partners will be able to better when they continue the exhibition both digitally and physically as well in other countries.

(GAJENDRA SINGH SHEKHAWAT)

राजीव रंजन मिश्रा, भा.प्र.से.

पूर्व महानिदेशक

राष्ट्रीय स्वच्छ गंगा मिशन

Rajiv Ranjan Mishra, IAS

Former Director General

National Mission for Clean Ganga

Message



Namami Gange programme is truly international in nature, because we believe that the world must unite in sharing its knowledge, technology and innovations to solve the most complex environmental issues. We have numerous international partnerships that enable us with capacity building, scientific & technical assistance, technology transfer, impact investing and others. However, we also believe that in the Ganga river basin we truly have a unique biodiversity ecosystem that requires multi-disciplinary thinking and collaboration to help address the key issues.

With that in mind, the Ganga Connect exhibition and outreach programme was conceptualised. The inaugural version was conducted across five cities in the UK from 08- 25 November 2021. Through the exhibition we were able to engage with over one thousand stakeholders across policy, regulatory, science, academia, technology, engineering, legal, finance, investments, and also have dialogue with Indian diaspora. This was a remarkable achievement for India and Namami Gange programme. Our engagement with the UK as a result has increased to a whole new level and we are now moving towards the implementation of various partnerships and collaborations achieved during the 1st through the 6th Indian Water Impact Summit organised jointly by cGanga and NMCG.

This also puts a spotlight on a trend that when nations unite for a common purpose and a cause then a lot can be achieved in a very short space of time. The need of the hour is to simplify complex and large ecosystem challenges into smaller projects that can be distributed amongst experts from around the world. The Ganga Connect Exhibition achieved just that.

We are so encouraged by the response that the interested parties are keen to carry the exhibition on in the UK for much longer. A digital version has also been planned and is being worked upon. The UK has also inspired other nations who are working towards their own version of the exhibition.

RAJIV RANJAN MISHRA

जी अशोक कुमार, भा.प्र.से.
महानिदेशक

राष्ट्रीय स्वच्छ गंगा मिशन

G Asok Kumar, IAS

Director General

National Mission for Clean Ganga



भारत सरकार

जल शक्ति मंत्रालय

जल संसाधन, नदी विकास और गंगा संरक्षण विभाग

Government of India

Ministry of Jal Shakti

Department of Water Resources,
River Development & Ganga Rejuvenation

From the Director General's Desk



Ganga Connect Exhibition has set a new benchmark in our international outreach and engagement strategy. The onus lies on us at NMCG to spread awareness on the critical issue of climate change and biodiversity conservation. In this day and age where most information sharing is done digitally, however much of that is done through dedicated or highly technical platforms. The unintended consequence of outreach through those platforms is the exclusion of the most important stakeholder which is the citizen. Through the Ganga Connect Exhibition, that travelled through 5 cities in the UK, the Indian diaspora and friends of India residing in Britain were able to engage in a dialogue with scientists and policy makers to understand the approach

government of India is taking in river basin management.

We were also able to increase the number of candidates enrolling in the ETV programme which is a structured pathway to bring in novel technologies and innovative solutions to the Indian market. NMCG is also looking forward to increase its engagement with the finance and investment community in the UK so that we can understand and develop advanced financial instruments to expand the financial sources for various waste-water and biodiversity projects in India. Since the exhibition there has been a marked increase in scientific dialogues between various research institutions in India and the UK. Finally, we look forward to the activation of various Ganga Connect chapters that have been established in the UK to ensure there is a continuous dialogue with all stakeholders.

We are also looking at ways to continuously add new data and information for subsequent Ganga Connect exhibitions in the UK and elsewhere in the world. For this digital technology will play a critical role. But the model of Ganga Connect exhibitions will always be a hybrid one so that the channel of our one on one engagement with the people always remains intact.

G ASOK KUMAR

गायत्री इस्सर कुमार, आई एफ एस
Gaitri Issar Kumar, IFS



भारत का उच्चायोग लंदन
The High Commission of India
London

Message



I am honoured to have inaugurated the Ganga Connect exhibition after its beautiful journey across the United Kingdom, flowing south from Glasgow, into Birmingham, Oxford and today India House in London.

'Namami Gange' is a salutation to Mother Ganga through a cross sector, interdisciplinary initiative that brings together public policy, technology intervention and community participation in a seamless manner. I am delighted that our 2021 Diwali offering to our diaspora was in the form of this beautiful exhibition which went to different cities in the UK.

The River Ganga is a lifeline to millions of Indians who live along its course and depend on it for their daily needs. The Ganga basin is the largest river basin in India as it constitutes 26% of the country's area, and supports almost 43% of India's population. It is a source of agrarian sustenance as it makes almost 60% of land fertile from its rich waters, but equally importantly it has provided generations of our countrymen and women philosophical and spiritual sustenance!

I would like to share with you all, that my officials and I had the privilege of attending the CoP26 conference, when Prime Minister Modi presented to the world his visionary Panchramrit strategy to combat climate change. India's leadership of the Coalition for Disaster Resilient Infrastructure and the International Solar Alliance amidst many other initiatives is evidence that climate action is not only public policy but an article of faith for him.

This is India's firm commitment to the planet and to our future generations and the Namami Gange Programme is a significant milestone towards our main aim of sustainable development through a range of collaborative projects.

I hope our Indian brothers and sisters in the UK who visited this exhibition, attended its informative seminars and talks, all of which was an excellent opportunity to learn about the need to preserve and protect this mighty River, and the sheer magnitude and complexity of this riverine system, and got answers from experts first hand.

I will end here with a small quote from the Mahabharata:

"Ganga always extends herself unto those that are devoted to her with humbleness of heart. She unites those that are so devoted to her with every kind of happiness." – (Mahabharata, Anusasana Parva, Chapter 27, Verse 100)

GAITRI ISSAR KUMAR

विनोद तारे

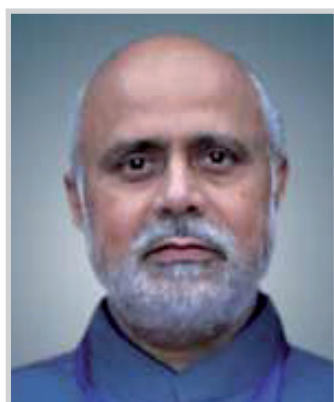
Vinod Tare

संस्थापक प्रमुख, सी गंगा
Founding Head, cGanga



Centre for Ganga River Basin Management and Studies
Indian Institute of Technology, Kanpur

Preamble



Indian civilization's iconic river Ganga, widely revered by Indians as Ma Ganga ("Mother Ganga"), has been a prime focus of attention of innumerable Indians and the Indian Government since the 1980s to revive and conserve our unique national asset, which had been deteriorating progressively since at least the 19th century due to the anthropogenic pressures of intensive agriculture, urbanization and industrialization. The restorative actions initiated by the Indian Government, especially under the Namami Gange program beginning 2014, constitute an ambitious effort to address the multifarious concerns of the Ganga river ecosystem – pollution, inadequate flows, river fragmentation, biodiversity loss, siltation, sand mining, dredging, affected floodplains,

loss of wetlands and wetland connectivity, etc. – as well as specific critical human issues such as floods, water scarcity, subsistence fishing, farming, navigation, boating, river-related tourism in particular, and ecology centric river based economic development in general. By addressing these issues from the perspective of the whole river basin, various river-affecting anthropogenic activities – both pre-existing and new, such as urban water, wastewater and solid waste management, agriculture, forestry, industries, mining, infrastructure projects, inland waterway/ navigation development, and climate change – can now be synchronized and calibrated with Ganga river restoration to enable holistic development in the Ganga River Basin. This multi-pronged approach is now becoming a template for restorative action for all rivers in India.

It is with the above backdrop that the Ganga Connect exhibitions and dialogues were organized all across the UK from Glasgow to London as described in this document. The enthusiasm showed by private companies, academia, news media, and the common people of UK – including a large swathe of the Indian diaspora – has been a meaningful and promising boost to our national efforts of Ganga rejuvenation. The major activities and outcomes of Ganga Connect – including many financial, technological and research tie-ups that can only increase with time – are presented in this document, and they stand testimony to the enormous global interest and growing knowledge integration for the successful restoration and holistic management of India's National River Ganga as well as other degraded rivers and ecosystems of India and, indeed, of the whole world! We welcome everyone's further initiatives and involvement in this knowledge-driven, humane and spiritual journey.

VINOD TARE

GANGA CONNECT: Journey of Ganga Rejuvenation

MINISTERS

Gajendra Singh Shekhawat*
Hon. Minister of Jal Shakti (Water)
Government of India



Bhupender Yadav
Hon. Minister of Environment,
Forests and Climate Change
Government of India

DELEGATION MEMBERS

National Mission for Clean Ganga

Rajiv Ranjan Mishra, Director General, National Mission for Clean Ganga (NMCG)

Rozy Agarwal, Executive-Director (Finance), NMCG

Ashok Kumar, Executive-Director (Projects), NMCG

D.P. Mathuria, Executive-Director (Technical), NMCG

Binod Kumar, Director, NMCG

Centre for Ganga River Basin Management and Studies (cGanga)

Vinod Tare, Founding Head, cGanga, (IIT-Kanpur)

Sachin Gunthe, Professor, Environment and Water Resources Engg., IIT-Madras

Prasanta Sanyal, Professor, Department of Earth Sciences, IISER, Kolkata

Vishal Kapoor, Sr. Project Scientist, cGanga, IIT-Kanpur

Sanmit Ahuja, Expert Member, cGanga, IIT-Kanpur

High Commission of India

H.E. Gaitri Issar Kumar, High Commissioner of India to the UK

Bijay Selvaraj, Consulate General of India, Edinburgh

Shashank Vikram, Consulate General of India, Birmingham

Raj K. Aggarwal, Honorary Consul of India, Cardiff

Rohit Vadhwana, First Secretary, High Commission of India, London

* Joined virtually from New Delhi, India

GANGA CONNECT: Journey of Ganga Rejuvenation

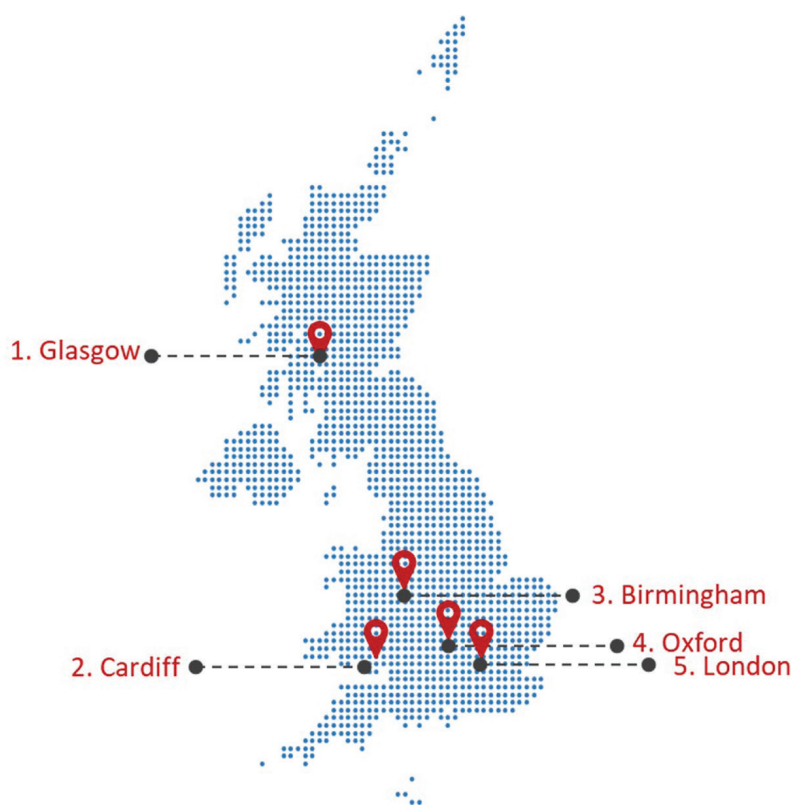
The Ganga Connect exhibition was conceptualised with a view to better engage global communities in one of the largest environmental programmes in the world developed in form of an exhibition and an outreach forum. The exhibition aimed to showcase multiple facets of the river basin in addition to connecting with various interested parties. The primary objectives of the exhibition were to:

- Offer a clear and deep understanding of the size, magnitude and complexity of the Ganga riverine eco-system
- Puts a spotlight on the solution sets that are being implemented
- Share a status update and execution timeline
- Illustrate the deep spiritual and philosophical connect that Indians have with the river
- Enable engagement with interested parties and the diaspora who want to get involved in the rejuvenation, restoration and conservation of the river system

Inaugural Version:

08 – 25 November 2021 | United Kingdom

The inaugural version of the exhibition ran from 08-25 November in the following five locations in the UK:



Exhibition Itinerary

Glasgow : 8-10 November 2021

Cardiff : 12-14 November 2021

Birmingham : 15-17 November 2021

Oxford : 18-19 November 2021

London : 23-25 November 2021

CITY 1: Glasgow, Scotland

Venue: City of Glasgow College, Glasgow
Dates: 08-10 November 2021

CITY OF GLASGOW COLLEGE



The Hon'ble Minister for Environment, Forest & Climate Change and Labour & Employment, Mr. Bhopender Yadav inaugurated the Ganga Connect exhibition showcased by National Mission for Clean Ganga, cGanga, and the High Commission of India in collaboration with the Asia Scotland Institut at the City of Glasgow College, which is the largest educational institute in Scotland.

The event was held on the fringe of the UN Conference of the Parties (COP-26) meeting in Glasgow with the exhibition attempting to showcase the level of development in the Ganga river basin to a global community of environmental stakeholders who had gathered in the city.

The exhibition was visited by a large gathering of Scottish business groups as well as international visitors who were participating in COP-26 meetings and other members of the Indian diaspora. The exhibition highlighted the river Ganga as a major lab and incubator for the global technology and the scientific community to develop cutting edge environmental solutions to some of the world's most pressing needs. The Initiatives like these are an important and effective way to attract innovators from around the world to learn from the international best practices.

Before the inaugural, an expert panel comprising Mr. Rajiv Ranjan Mishra (Director General, NMCG), Prof. Paul



The audience at the Ganga connect exhibition area in City of Glasgow College



Business / Industry roundtable in City of Glasgow College

Little (Principal and Chief Executive of City of Glasgow College), Rick Minchom (Director of Development, The Asia Scotland Institute), Roddy Gow (Chairman, The Asia Scotland Institute), Mr. Sanmit Ahuja (Expert Member, cGanga), Prof. Bob Ferrier (Director, James Hutton Institute (CREWS)), Dr. Isabella Guerrini de Claire (COO, Aurora Sustainability Group), Mr. Allan Reid (Director, Scottish Environmental Protection Agency), Mr. Jai Mallick (Associate, Foresight Group), Dr. Mark Fletcher (Global Water Leader, Arup), Dr. Gen Cannibal (Technical Director, Holistic Energy), Dr. Michael Groves (Founder and CEO, Topolytics), Mr. Michael Alexander (Global Head of Water, Environment, Agriculture Sustainability, Diageo), Mr. Kevin Houston (Co-founder and Owner, Carbon Masters), Prof. Martin Tangey (Founder and President, Celtic Renewables), Murray Bainbridge (Senior Trade Specialist, Energy/ APAC at Scottish Development International), Mr Dhruva Kumar (Curriculum Head, Marine Engineering at the City of Glasgow College) were joined for a strategic discussion on how Scotland and India can collaborate to address water and climate change related issues.

Welcoming the participants, Prof. Paul Little emphasised that it is time for action, not talk, to take global precedence and welcomed Indian scientists and government to join hands to work together in solving critical global environmental problems.

Mr. Roddy Gow spoke about great depth of valuable and innovative talent and companies innovations available in Scotland which can be of significant value to India in its sustainable development endeavours.

Mr. Rajiv Ranjan Mishra, Director General, NMCG spoke about the approach and actions undertaken by Namami Gange for holistic rejuvenation of the Ganga River Basin. He highlighted that how the Government of India welcomes global collaborations to solve the complex issues within the Ganga system.

The Expert Roundtable organized as a cross learning session amongst the experts pertained to the need for developing sustainability-oriented leadership and science-based empowerment, the need to focus on digital infrastructure and evidence-based solutions driven by data, the need for collaboration between regulators, big business and community level stakeholders, the need to focus on solutions that are available to us now as opposed to 10 or 15 years down the line, the need to understand how to let capital accelerate the changes needed, the need for action at scale and the need to optimise the sharing and distribution of knowledge with a view to co-constructing an enabling environment for optimizing stakeholder engagement based on both evidence based sustainable practices and international best practices.

CITY 2: Cardiff, Wales

Venue: Cardiff University, Wales
Dates: 12-14 November 2021



After a successful debut at COP-26, Glasgow, the Ganga Connect exhibition was inaugurated in Cardiff, capital of Wales on Friday 12th November 2021.

The inauguration was done at Cardiff University, by The Rt. Hon. Mark Drakeford MS, First Minister of Wales and H.E. Gaitri Issar Kumar, Indian High Commissioner to the UK.



HC Gaitri I Kumar & First Minister of Wales Rt Hon Mark Drakeford, Mr Ashok Singh Executive Director NMCG, Honorary Consul Raj K. Aggarwal, Chancellor Baroness Jenny Randerson Cardiff University.

In her inaugural speech, the High Commissioner of India to the UK, highlighted how Indians revere the river and brought to everyone's attention the importance the Government of India puts on the Namami Gange mission. She further commented that in his travels, the Greek philosopher Pythagoras

is believed to have learnt significant part of his knowledge in India on the banks of river Ganga.

In his keynote address, the Mark Drakeford MS said that borders are irrelevant in the climate crises and impacts cannot be mitigated by individual countries acting alone, with international collaboration being the only way forward.

GANGA CONNECT

(JOURNEY OF GANGA REJUVENATION)



The First Minister and the High Commissioner were given a tour and explanation of various aspects of the Ganga rejuvenation programme by Mr. Ashok Kumar, Executive Director – Projects, NMCG and Mr. Sanmit Ahuja, Expert Member, cGanga.



Mr. Ashok Kumar, Executive Director – Projects, NMCG gifting the coffee table book "Rowing down the Ganges" to the First Minister of Wales in presence of the Indian High Commissioner to the UK.



The exhibition also marked the annual Diwali celebrations, which is a must-go to event for the strong diaspora community in Wales. Over 150 members of the diaspora and scientific community participated in the combined Diwali and Ganga Connect launch function.



To mark the occasion, the Cardiff Castle was lit up with Indian tricolour lights, with the Indian flag also flying alongside the Welsh flag.



Scientific roundtable at the Cardiff University Water Research Institute.

Earlier in the day two strategic roundtables were organised – scientific and a business/industry roundtable. The scientific roundtable was hosted by: The Water Research Institute which is part of the Gw4 Water Alliance, which is the largest water focused initiative in the UK comprising of Universities of Cardiff, Bath, Bristol and Exeter.

A 20-member roundtable met and presented their research and scientific works. From India, IIT-Kanpur, IIT-Madras and IISER Kolkata represented the scientific community. Key topics and areas of collaboration that were discussed are:

- Transforming Indian cities to Liveable cities
- Water budgets and pollution in Ganga river basin

- River ecosystem studies in Wales and the Himalayan mountains
- Climate change and Indian monsoon
- Biodiversity profiles of river systems, threats to it and conservation measures
- Hydrology of environmental ecosystems
- Biological profile of Ganga river basin: salient aspects, treats and conservation measures

The Welsh Government also organised a business and industry roundtable where a number of companies with innovative technologies and solutions participated. These companies learnt of the Environment Technology Verification (ETV) process that is run by cGanga under the aegis of NMCG to bring new innovations to market.

Speaking at the industry roundtable in Cardiff, ED-Projects, Mr. Ashok Kumar Singh said that the Government of India is fairly open and technology agnostic since the evaluation is done on the quality and cost of the output which could be treated water or another relevant measure.

The companies presented a range of innovative solutions including:

- Biorefining of waste materials
- Waste to hydrogen
- Advanced techniques to eliminate sludge production in waste water treatment
- Novel materials that act as highly efficient filter media
- Yield enhancer in agriculture sector

In continuation as a part of the UK-India exhibition, on second day Cardiff, the exhibition was visited by various members of the Indian diaspora community. The response from the local community was overwhelming and based on the feedback it was understood that people were very appreciative and amazed by the efforts towards clean Ganga Mission. Many of the visitors expressed further interest in knowing more about the various aspects of the Mission.

On the third and last day, the exhibition received unprecedented response. The members of the delegation had very productive, informative, and fruitful interaction with the local where the information about the Ganga and the National Mission on Clean Ganga was disseminated to the exhibition visitors.

To mark the end of the exhibition Mr. Raj K. Aggarwal, Honorary Consul for

India with jurisdiction for Wales, made a courtesy visit to the exhibition. He praised the efforts put in by the Indian delegation and congratulated the efforts put in by all the stakeholders. He was very appreciative and thankful to all the involved parties for choosing Cardiff as one of the five locations for this exhibition, dialogue, and interaction.



Ganga Connect exhibition centre in Cardiff University.



Indian delegation attempts to connect local Indian community with Namami Gange programme.



The Indian delegation was also invited by the members of local Indian community to a Mandir and the Community Centre in Cardiff. The Ganga Connect team explained to various attendees the size, complexity and the magnitude of the programme.

The members showed keen interest in the Namami Gange initiative, and many asked for various forms of engagement with the programme. After the visit to the temple a business dinner was hosted and arranged by the local Indian community.

During dinner, the local Indian community thoroughly appreciated the efforts and pledged to support the mission in whatever best way they can.

CITY 3: Birmingham, England

Venue: Birmingham City University

Dates: 15-17 November 2021



BIRMINGHAM CITY
University

Part of Birmingham City University



The exhibition in Birmingham was inaugurated by Prof. Philip Plowden, Vice Chancellor of Birmingham City University, Dr. Shashank Vikram, Hon. Consul General of India in Birmingham and Mr. D.P. Mathuria, Executive Director – Technical, NMCG. This was done amongst an august gathering representing

various community and stakeholder groups.

Welcoming everyone to the Royal Birmingham Conservatoire, a new building used predominantly for students learning Music, Prof. Plowden lauded the efforts of the Government of India to bring an exhibition of such an importance to the University.



Prof. Philip Plowden, Vice Chancellor of Birmingham City University, Dr. Shashank Vikram, Hon. Consul General of India in Birmingham and Mr. D.P. Mathuria, Executive Director – Technical, NMCG, inaugurates the Ganga Connect exhibition.

GANGA CONNECT (JOURNEY OF GANGA REJUVENATION)



(A) & (B) Ganga Connect exhibition centre in Royal Birmingham Conservatoire, Birmingham City University;
(C) Prof. Philip Plowden, Vice Chancellor of Birmingham City University visited the exhibition arena.
Mr. D.P. Mathuria were given a tour and explanation of various aspects of the Ganga rejuvenation programme.

He said the University campuses are all about the community and embodied the spirit of partnership and collaboration. He was pleased that a number of faculty from the school of engineering and sciences will participate in the scientific dialogue. In a separate dialogue, He also suggested that Namami Gange team should come back to Birmingham to present the exhibition during Commonwealth Games 2022.

Dr. Vikram, highlighted the significant size of the Indian population in the Midlands area and contributions made by the community in the region. He emphasized the role of modern technologies in tackling major environmental

problems and stressed that it is only through partnerships and collaboration one can achieve the goal.

The inauguration was followed by a business round table discussions with nearly 30 participants that included leading industrialists, technology innovators, members of the local government and eminent members of the Indian diaspora.

The discussion was led by Mr. D.P. Mathuria and moderated by Mr. Sanmit Ahuja. Mr. Mathuria put the governmental prospective and their approach towards Ganga cleaning. He also summarized the cluster wise industrial issues.

Dr. Shashank Vikram, Honorable Consul



Business round table discussion in Royal Birmingham Conservatoire.

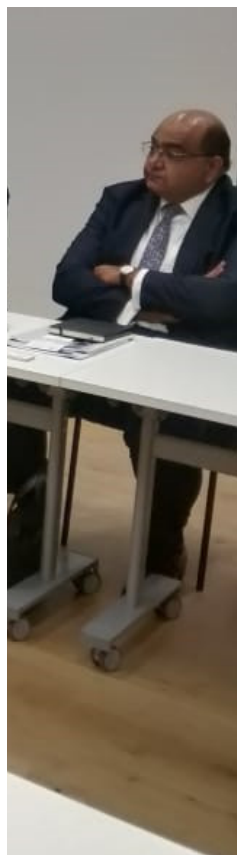
General of Indian in Birmingham talked about the proactive government approach towards the investment security in the projects related to Ganga River rejuvenation.

Mr. Mathuria and Mr. Ahuja addressed the queries and explain the government priority areas such as wastewater treatment, data and information, agriculture, and others. Companies present included those with expertise in wastewater treatment, hydrogen, biogas, data and

information and advanced engineering.

Mr. K. Jones, a technology innovator for tyre recycling shared his experiences of successfully going through the ETV programme.

Mr. J. Sohl, another leading businessman from Birmingham, shared his experiences of introducing technologies into India via the ETV process. He also stressed that rejuvenation of Ganga should have social inclusion as a central tenet.



During the three days, Mr. Mathuria and Mr. Ahuja, also visited the premises of a major food processing industry to assess the implementation of an industrial waste-water (effluent) treatment facility.

In this particular case the facility was processing beetroot vegetable and generated significant effluent which was not only being fully treated to drinking water quality level, but was also being processed for resource recovery of certain key minerals that significantly enhanced the economic viability of the business case of the implementing the treatment plant.

Mr. Mathuria commended the operations and said that there is a very big potential for such technologies in the Ganga basin as well as the wider Indian market.



Food processing execution group members at a vegetable processing facility in Birmingham having advanced wastewater treatment facility with resource recovery.



Demonstration of Food processing industry generated wastewater treatment technology.

The inventor of the technology Dr. Liam Ryan demonstrated that how highly polluted water stream from the food processing plant was being treated in less than a minute to a level that can either be discharged into the rivers or even taking it to a drinking water level. He demonstrated the efficacy of the technology by drinking the treated water stream.

He said that the proprietary fractionation-bioreactor technology removes 95% of suspended solids and other pollutants from the polluted water stream. The technology also removes all microplastics from the waters. He said, that the polluted water naturally contains microflora that are required to breakdown the pollution. This particular technology promotes the growth of such microbes as well as oxygenates the water promoting growth.

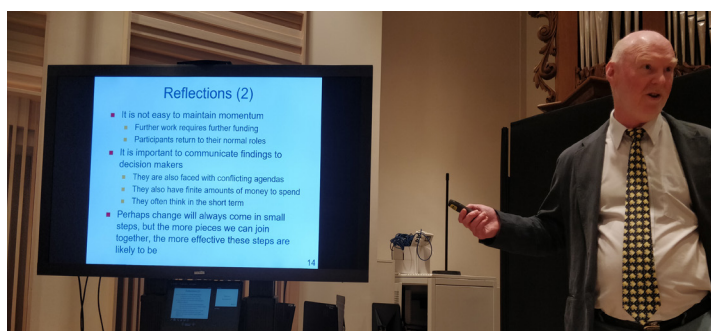


Dr. Ryan also demonstrated the floating water treatment system that pulls water from up to 10m below the surface into a reaction chamber where the liquid is aerated and treated and pumped back out across the surface of the water. He further added that the technology aids in breaking down



pollution and promotes the growth of good bacteria in the water leading to the river healing itself. The system also increases the amount of oxygen in the water by 5-10% which is an essential indicator of river health.

Mr. Mathuria suggested that such a system can be very beneficial particularly in the open drains or small tributaries where it is difficult to establish a dedicated waste-water treatment plant.



Dr. Roger Wall presenting the status of "Building resilience in flood disaster management in Northern Peru".

The delegation also met up with community leaders from Birmingham and the Midlands area. The organisation of the roundtable was facilitated by the Consul General of India in Birmingham. Various members of the community shared their thoughts regarding how best to keep the community engaged as well as contribute towards the Namami Gange programme.

Specific suggestions included:

- To collate the calendar of activities all the various religious and community organisations and to exhibit the Namami Gange programme in those events
- To participate in talk shows at local radio stations
- To engage the youth more pro-actively and get them to lead the efforts

The scientist delegation met up with scientists from the Birmingham City University.

Dr. Vishal Kapoor of IIT-Kanpur presented the current scenario and the key challenges faced by the biological forms of Ganga River in recent times. The role of anthropogenic interventions on the historical and current migratory route of the Ganga river dolphins, their constraints, floundering status and Government initiatives to conserve the species were also discussed.



Floating water treatment system.

Dr. Sachin S. Gunthe of IIT-Madras, presented on "Climate change and Indian Monsoon: Dry or Wet Future?".

Dr. Prasanta Sanyal of IISER-Kolkata, presented on "Understanding the water budget and pollution in the Ganga river Basin: A stable isotopic approach".

From the Birmingham City University Dr. Kathryn Moore presented the issues related to "West Midlands National Park" and Dr. Roger Wall presented the status of "Building resilience in flood disaster management in Northern Peru".

The scientists agreed to collaborate to develop a project around nature based eco-systems.



Dr. Sachin S Gunthe of IIT-Madras expounding on the impact of Climate change on the Indian Monsoon.

CITY 4: Oxford, England

Venue: Oxford India Centre for Sustainable Development,
Somerville College, University of Oxford

Dates: 18-19 November 2021



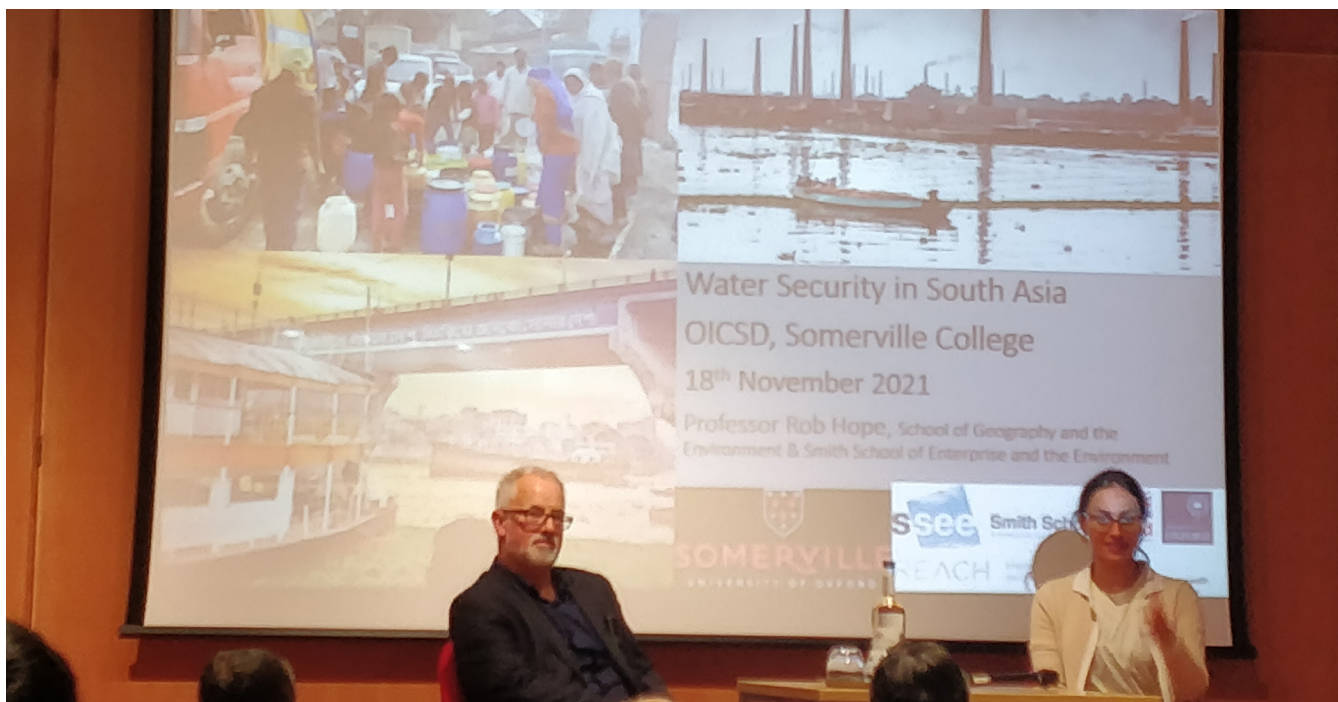
The Oxford India Centre for Sustainable Development (OICSD) at Somerville College, Oxford University played host to the Ganga Connect exhibition in its fourth leg of the UK wide tour.

Prior to the inauguration, OICSD hosted a seminar on Water Security in South Asia.

Baroness Janet Royall of Blaisdon, Principal

of Somerville College, welcomed the speakers and more than 40 scholars from Oxford University in attendance. The keynote speaker of the seminar, Prof. Robert Hope, Director, Water Security Initiative, School of Geography and the Environment delivered an address focused on water security issues in South Asia.

Prof. Robert Hope started his talk with the



Prof. Robert Hope, Director, Water Security Initiative, School of Geography and the Environment, delivered a lecture on "Water Security in South Asia" at Oxford India Centre for Sustainable Development, Somerville College.



Prof. Vinod Tare, Founding Head cGanga, Mr. Sanmit Ahuja, Expert Member cGanga, Janet Anne Royall, Baroness Royall of Blaisdon, Principal of Somerville College, addressing target audiences.

presentation focusing on the Water Security addressing the issues of Bangladesh and India. He related the water economics with ground water quality, climatic variability, and other key factors. He also appreciated the Government of India for their initiatives under Jal Jeevan Mission. He then presented scholarly, empirical research conducted by Senior Research Associate, Dr. Sonia Hoque, Oxford Indira Gandhi Scholar, Dr. Ranu Sinha, and Oxford Felix Scholar, Ms. Medha Mukherjee. He highlighted recent research conducted by the Indian student, Ms. Mukherjee on water inequalities in informal settlements of Kolkata megacity during the Covid-19 pandemic.

He also shared the work of development finance institutions and government of Madhya Pradesh's interventions in modernizing the irrigation systems. At the end he put his thoughts on the prospects for water security in South emphasizing the importance of interdisciplinary research to address the water related issues. He highlighted that water security is a function of risk to the system which focuses the attention of all stakeholders on one common objective.

After Prof. Hope's address, Dr. Vinod Tare explained to the participants the complexity of a river system as large as the Ganga. In his talk, he emphasized the need for not just inter-

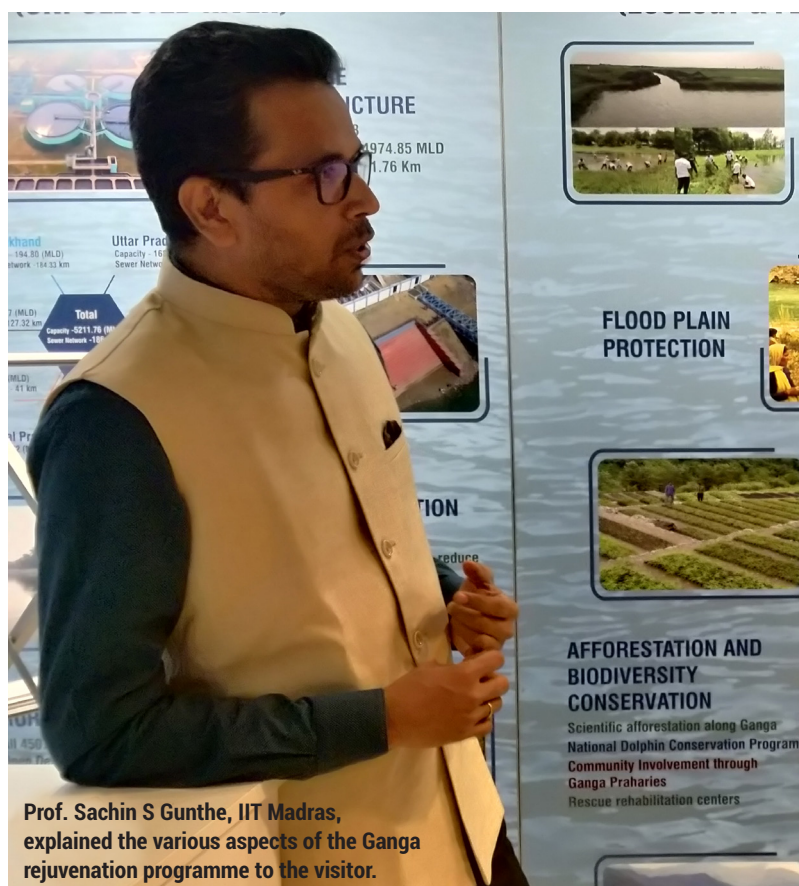


Mr. Rohit Vadhwa, First Secretary, High Commission of India, London, presented the Indian Government's perceptions and initiatives taken under the Namami Gange Programme.

disciplinary research but also the importance of connecting with the communities.

He stressed that in addressing water security communities have to play a crucial role. Without their active and informed participation, we will not achieve our goal and pointed out Hon. Prime Minister Modi's approach on Arth Ganga, which brings sustainable economic development to the core of river development functions.

Dr. Tare went on to explain that River Ganga is symbolic of all rivers in the country and said that given the global environmental and climate change problem, the world must unite in addressing these issues. He stressed on the Sanskrit phrase Vasudevan Kutumbakam – the world is one family, the underlying principle



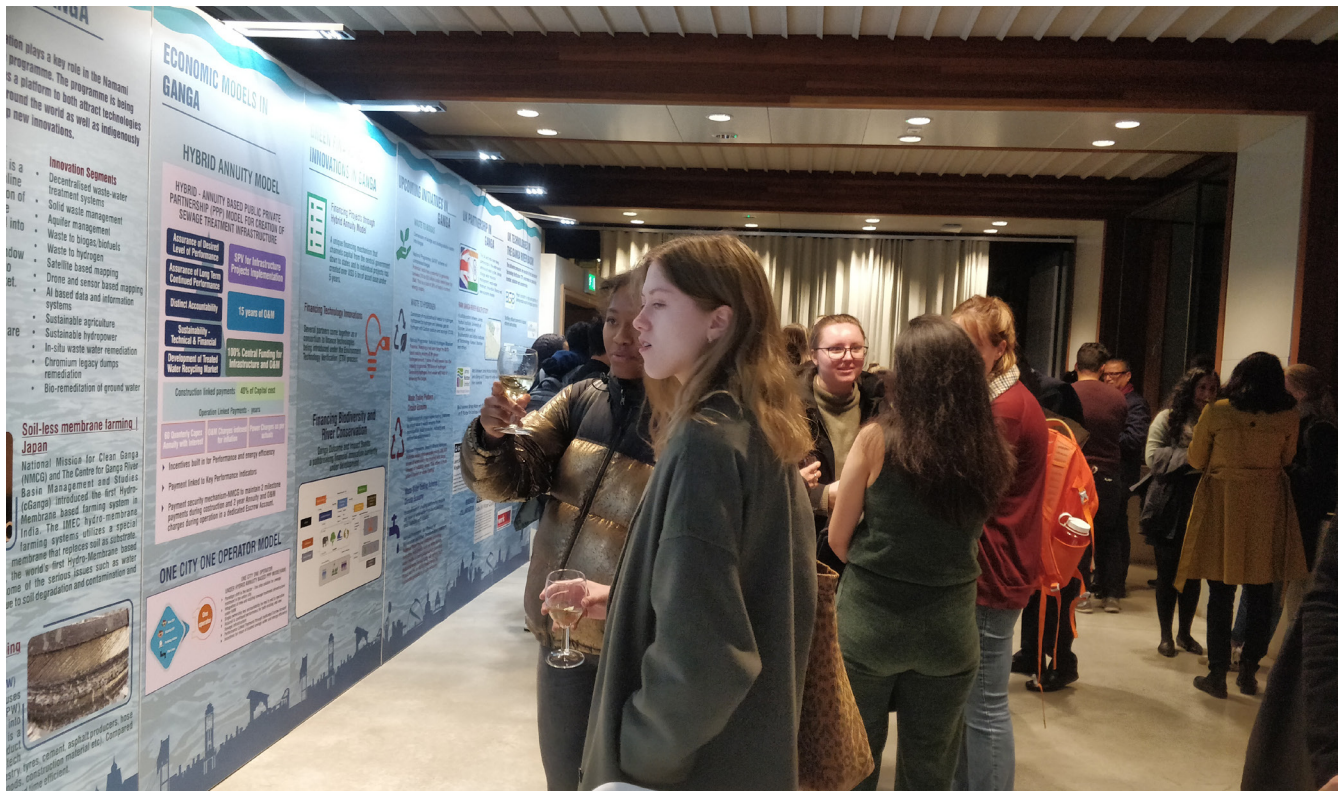
Prof. Sachin S Gunthe, IIT Madras, explained the various aspects of the Ganga rejuvenation programme to the visitor.



through which the Namami Gange programme is being delivered.

Following Dr. Tare, Mr. Sanmit Ahuja, provided his expert insights. He stated that he was glad to be visiting Somerville College again, and went on to explain the importance of establishing world-wide scientific bridge with River Ganga because river conservation and pollution was a global issue, and one that also affects majority of the UK rivers. He explained to the scholars the key components of the exhibition and how it had generated tremendous interest across various stakeholder groups across in the UK. In doing so, he emphasized that the purpose of this exhibition is multi-faceted: to learn from each other, to share knowledge, to not make the same mistakes, and more importantly, disseminate successful models.

He spoke of the multi-disciplinary efforts of the Ganga Rejuvenation programme and explained the work done on innovative financial instruments such as the Ganga Impact Bond.



GANGA CONNECT

(JOURNEY OF GANGA REJUVENATION)

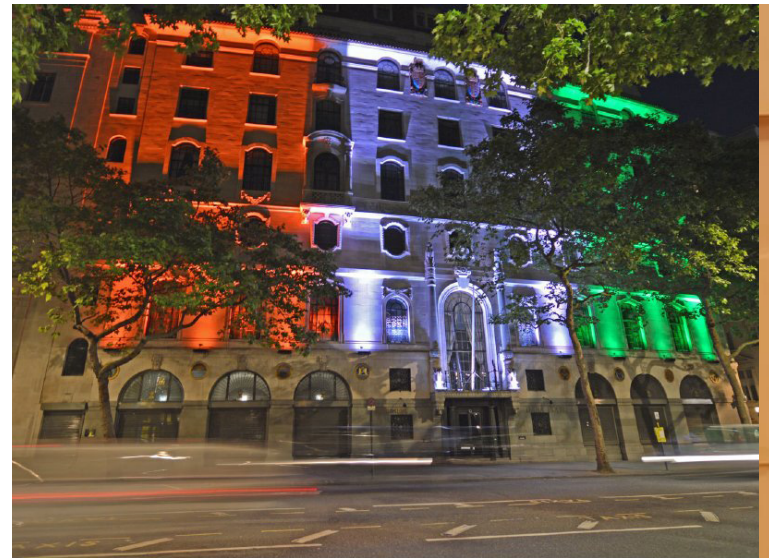


CITY 5: London, England

Venue: India House, High Commission of India, London
Dates: 23-25 November 2021



भारत का उच्चायोग, लंदन
High Commission of India
London, United Kingdom



The High Commission of India played host the to the Ganga Connect exhibition during its fifth and final leg in the UK.



Exhibition center/ lighting
the lamp arena at India
House, London.

GANGA CONNECT (JOURNEY OF GANGA REJUVENATION)



The exhibition was inaugurated by H.E. Gaitri Issar Kumar, Indian High Commissioner to the UK India House at Aldwych, London. She was joined by Mr. Rozy Agarwal, Executive Director – Finance, NMCG and Dr. Vinod Tare, Founding Head, cGanga.

In her inauguration remarks, the High Commissioner said was honoured to inaugurate the Ganga Connect exhibition after its beautiful journey across the United Kingdom, flowing south from Glasgow, into Cardiff, Birmingham, Oxford and today India House in London. She further added that as a source of physical and spiritual sustenance, this mighty river is often referred to as Mother, both as a source of nature and nurture. In the words of Pandit Jawaharlal Nehru, 'The Ganga to me is the symbol of India's memorable past which has been flowing into the present and continues to flow towards the ocean of the future'.

Reverence for River Ganga in India is as old as Indian culture itself, which is clearly evident from the descriptions in our ancient Indian scriptures such as the Vedas, Puranas, Upanishads and the Ramayana and Mahabharata. The Magadhas, Guptas and the Mughals founded their mighty empires along the Ganga basin. This was also the place which created the essence of Hinduism, Buddhism, Jainism and Sikhism; infact it is respected across all religions in India because of the deep faith in the healing powers of its holy waters. The Mughal emperor Akbar's preference for "the water

of immortality" has been recorded in no little detail in the Ain-i-Akbari by Abul Fazl.

Today however, despite the rich wealth of its heritage and huge socio-economic benefits, this mighty river is facing myriad threats due to pollution, population growth, incommensurate levels of urbanization, and industrialization which have all affected the flow, volume, and quality of water resulting in a growing threat to biodiversity and the life forms it sustains.

She further said that she had the privilege of attending the COP-26 conference earlier in the month, when Prime Minister Modi presented

to the world his visionary Panchramrit strategy to combat climate change.

The exhibition in London had a special interactive panel that provided the visitors with information around the various projects that the National Mission Clean Ganga was running across the entire river basin. A further 20 highly informative panels described the various facets of the entire Namami Gange programme.

On its inaugural day, the exhibition was visited by various eminent members of the Indian diaspora community, members of the press corps and over 200 staff of the Indian High Commission in London.



Digital platform to dispense the knowledge and showcase the activities conducted under Namami Gange Programme.



High Commissioner were given a tour and explanation of various aspects of the Ganga rejuvenation programme by Mr. Rozy Agarwal, ED-Finance, NMCG and Prof. Vinod Tare, Founding Head, cGanga.

Finance Roundtable

The day 2 was initiated with the Finance Roundtable which was chaired by Mr. Rozy Agarwal, ED-Finance, NMCG and moderated by Mr. Sanmit Ahuja, Expert Member, cGanga. Over 30 leading investment bankers, fund managers, legal and financial services professionals participated in the roundtable.

Mr. Agarwal explained the various financing models currently being adopted in the Namami Gange programme. Thereafter Mr. Ahuja moderated the discussion with the

participants and the following points were discussed and debated at length:

- Water pricing and enforcement of environmental regulations was critical to attract more investments in the water and waste-water sector.
- There is a strong demand for high quality green projects, but investors need to understand the underlying revenue model of the projects which was not very clear. This point was expanded upon and that it was clarified that there were two business models: (a) where



Finance roundtable in India House, London.

there was off-take of treated water available from industrial or commercial users and (b) where the government would provide the revenue stream (under the hybrid-annuity-model/ HAM) for discharge of treated water into the river systems in case there wasn't a clear off-take available.

- The HAM framework has had a good take-up by the industry as it provides a middle pathway that requires the risk sharing to

be done equally by the Government and the private sector that is investing in the construction and operations of the wastewater treatment plants over the lifetime of the concession.

- Various investors present in the room commended on the Government of India's vision on bringing out various bonds – green-bonds, blue-bonds, impact and biodiversity bonds.

Business Roundtable

The day 2 ended with a business roundtable whereby various business opportunities were highlighted. This session was co-chaired by Mr. Rozy Agarwal, ED-Finance, NMCG, Dr. Vinod Tare, Founding head, cGanga and moderated by Mr. Sanmit Ahuja, Expert Member, cGanga. Over 30 technology, engineering and utility companies participated in the roundtable.

The session was initiated with Mr. Agarwal and Dr. Tare highlighting the extent of opportunities that the Namami Gange programme offered to the prospecting companies. The following points were highlighted in detail:

- India is offering one of the largest commercial opportunities to companies wanting to introduce innovative technologies and solutions in the water, waste-water and environment sector.
- cGanga and NMCG have established a formal mechanism, called the Environment Technology Verification

(ETV) programme, for accelerating new technologies into the market.

- The ETV framework was already very well established with nearly 40 technologies from around the world going through the programme. The UK was the single largest contributor to the programme with nearly a quarter of the technologies coming from the country.
- The ETV programme was accelerating technologies across a range of sectors including: decentralized waste-water treatment, resource recovery, waste to biofuels / biogas / hydrogen, sustainable agriculture, data and information systems including remote sensing, artificial intelligence, decision support systems and water resource management.
- It was also highlighted that energy efficiency, energy recovery and energy generation will be a key focus area particularly new energy areas such as hydrogen generation.



Business roundtable in India House, London.



Scientific Roundtable

Day 3 of the exhibition started with a scientific roundtable led by Dr. Vinod Tare with support of the entire scientific delegation. A number of scientists participated in the roundtable including University College London (UCL), University of Surrey, Queens Mary University, University of Oxford and others.

Dr. Tare explained in detail the role of science not only in river conservation but also in nation building through flagship programmes such as the Namami Gange project. The following key aspects were raised during the roundtable:

- The first Ganga River Basin Management Plan (GRBMP) that was prepared by a consortium of seven Indian Institutes of Technology (IITs) and submitted to the

Government of India in 2014. This first version of the master-plan introduced the concepts of "Nirmal Dhara" or clean river stream and "Aviral Dhara" or continuous river stream. The master-plan was developed using a top-down approach.

- GRBMP 2.0 was now starting and that would take a bottom-approach which would look at lower order rivers and tributaries.
- The concept of Arth Ganga was going to be a central principle which will bring river centric sustainable development and economic growth.
- Discussions also took place on how best to develop a scientific collaboration bridge between UK and India for major programmes such as the Namami Gange framework.



Prof. Tare, Founding Head, cGanga, IIT Kanpur, elucidates the existing issues and initiatives taken by Government of India for conservation and rejuvenation of rivers in Ganga river basin.



Community roundtable in India House, London.

Community Roundtable

The final roundtable of the Ganga Connect was a community roundtable in which various representatives of the Indian diaspora community in the UK were able to have an open and progressive discussion on various topics with Mr. Gajendra Singh Shekhawat, Hon'ble Minister of Jal Shakti, Government of India and Mr. Rajiv Ranjan Mishra, Director General, NMCG, who both joined virtually from New Delhi India. Summary of Minister's and Director General's responses are as follows:

- The role of the Ganga Connect exhibition is to connect with scientists, climate change specialists, environmental technology proponents, investors, finance community and the diaspora.
- The UK is known for its financial services sector, and we have had significant interest from the industry in financing of technologies and innovation as well as projects via innovative financial instruments such as the Ganga biodiversity bonds.
- In addition to the water treatment sector, we are also getting tremendous interest from the energy industry who are seeing the tremendous

potential of generating energy out of the waste streams in the Ganga. We are pleased to announce collaborations on biogas generation from waste and sludge, biofuel generation from industrial effluents, hydrogen from solid waste, run-of-the-river hydropower, developing a modern canal network and sustainable transport systems within the Ganga.

- NMCG is also setting up a charity in the UK in the coming weeks and to further increase the outreach the exhibition will be showcased in community centres, temples and various events throughout the year. The Minister requested diaspora leaders' support to mobilise community engagement with the help of the local Ganga Connect chapters. NMCG will support the exhibition in virtual formats through the Ganga Connect website and social medial channels.
- NMCG is very pleased to hear that the community has whole-heartedly embraced engagement with the Namami Gange programme and have set up chapters throughout the country such as Scotland Ganga Connect; Wales Ganga Connect; Midlands Ganga Connect and London Ganga Connect.



Indian diaspora community members virtually interact with Mr. Gajendra Singh Shekhawat, Hon'ble Minister of Jal Shakti, Government of India.

Networking Reception and Dinner

The Ganga Connect exhibition and outreach programme ended with a strong participation of interested parties and major stakeholders at a networking reception and dinner where the Chief Guests were H.E. Gaitri Issar Kumar, Indian High Commissioner to the UK, Dr. Paul Little, Principal and CEO of City of Glasgow College, Mr. Rozy Agarwal, Executive Director-Finance, NMCG, Mr. Raj K. Aggarwal, Honorary Consul for India with jurisdiction for Wales and various other eminent persons.

The High Commissioner delivered a keynote address where she said that this exhibition

will not only showcase to the world the deep spiritual connection that generations of Indians have with the Ganga, but also discussed best practice solutions so we can develop leadership oriented towards sustainability, green funding, optimising stakeholder engagements: all geared towards the holistic rejuvenation of the Ganga River Basin.

Mr. Rozy Agarwal made key announcements and invited all the partners who made the exhibition meaningful and successful over the 17 day period. Dr. Vinod Tare, shared with the audience how modern science was blended with traditional wisdom to deliver a holistic rejuvenation programme.



Community/ Business interaction during networking reception and dinner at Hotel Taj, London.

GANGA CONNECT (JOURNEY OF GANGA REJUVENATION)



Key achievements and announcements during networking reception and dinner in Hotel Taj, London.

Key Achievements and Announcements of the Ganga Connect Exhibition

1. Ganga Connect UK Community Engagement Chapters

The primary objective of the Ganga Connect exhibition was to engage with the UK community. We have received major support from community members from all across the UK. The community leaders are forming chapters across the country that will establish a link between members and the Namami Gange programme. The chapters established are:

- a. Scotland – Ganga Connect
- b. Wales – Ganga Connect
- c. Midlands – Ganga Connect
- d. London – Ganga Connect

Each chapter will have convenors who will connect various interest groups with the Namami Gange programme including scientists, technology companies, investors and community members.

The chapters will host workshops and outreach programmes throughout the year to raise awareness about the Namami Gange programme.

Nearly 100 members have joined the four different chapters already.

Parties Involved: NMCG, cGanga, HCI and Community Engagement Chapters.

2. Twinning of Rivers

- a. Twinning of rivers to share knowledge and experiences of river basin management including community engagement programmes.

Parties Involved: Local Governments and NMCG – to be led by High Commission of India, Ganga Connect UK Chapters.

3. India-Scotland Water Partnerships

- a. Building upon the NMCG – Government of Scotland MOU of 2017.
- b. This collaboration will support in channel the high level of interest amongst Scottish entities specialising in water into entering the Indian market.
- c. The Namami Gange programme will act as a major platform for Scottish entities to enter the Indian market.

Parties Involved: The Asia Scotland Institute and cGanga.

4. Smart Ganga Canal project

To develop a Smart Ganga Canal project in collaboration with City of Glasgow College and the Asia Scotland Institute for the benefit of local communities in India supporting agricultural development and local employment.

Parties Involved: The Asia Scotland Institute, City of Glasgow College and cGanga

5. Ganga Finance and Investments Forum

A number of investors and finance companies have come together to establish the “Ganga Finance and Investments Forum (GFIF)”. The group will develop state of the art financial

instruments such as river bonds, blue bonds, impact and outcome bonds, credit enhancement and guarantee instruments. They will go on to establish specialist vehicles to channel investments around the world into the Namami Gange programme. The group has agreed to develop the first of its kind River biodiversity and conservation bond to channel long-term investments into ecosystem conservation. It will also provide ongoing support to NMCG and the Namami Gange programme for continuous funding and project finance for various initiatives.

Parties Involved: Investments and Finance Consortium, NMCG and cGanga.

6. Technology & Innovation enrolled into the ETV programme

In continuous expansion of the ETV programme three innovative technology companies were selected and on-boarded onto the ETV programme

- a. Technology 1:** Floating water treatment system | Company: SmartOps.
- b. Technology 2:** Forward Osmosis | Company: Forward Water Technologies.
- c. Technology 3:** Odour Control | Company: OSIL.

7. Tech & Innovation Financing

The ETV programme has now started to graduate companies successfully that are ready to scale up. In doing so they need venture funding to start rolling out the projects across the country. To support the successful

candidates a partnership with OPG Power Ventures, a company listed on the London Stock Exchange, is being established that will create upto a GBP 3mn (INR 30 crore) facility to fund technologies and innovations.

Parties Involved: OPG Power Ventures (listed on London Stock Exchange) and cGanga.

8. UK-India Scientific Collaboration

A number scientists and research institutions agreed to come to form a knowledge pool for exchange of scientific and technological ideas leading to development of collaborative research. The scientists agreed to focus the collaboration towards applied innovation for rejuvenation of rivers systems, conservation of biodiversity, measures to combat the impact climate change on ecosystems and create sustainable models for economic development.

Scientists and academics from the following institutions agreed to establish a collaboration bridge between India and the UK: James Hutton Institute, City of Glasgow College, Strathclyde University, Cardiff University, Birmingham City University, Oxford University, University College London, University of Surrey and Queen Mary University.

9. Global Youth for Ganga

The Global Youth for Ganga will be an association of youth from India and other countries on a common mission to exchange knowledge and expertise, through advocacy for a clean Ganga, and all rivers at large. The

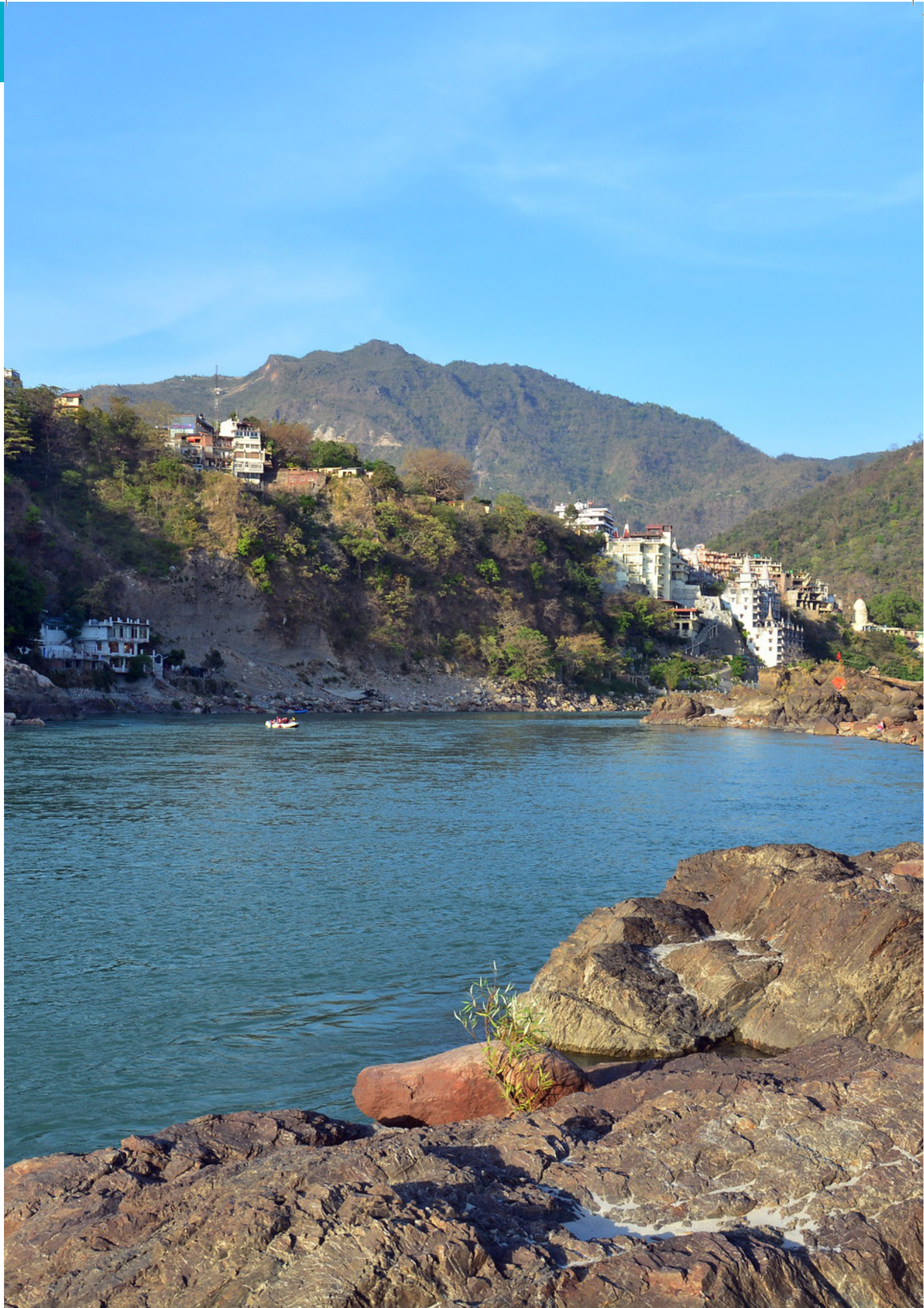
association will engage in interdisciplinary discussions, raising worldwide awareness, and encouraging engagement in the Clean Ganga Mission, bringing together young students, researchers and professionals across the globe. The aim is to make Clean Ganga a reality and also to inspire the rest of the world to take similar initiative in their states down to the very grassroot level. A mission empowered by the youth, is a mission which can keep thriving for future generations to come, constantly gaining momentum. The youth today are more aware about climate change than ever before, and

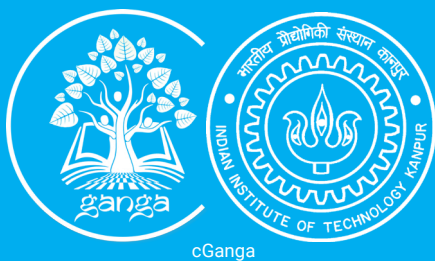
it is their care and commitment that we shall support for a more sustainable future ahead.

10. Finalisation of Clean Ganga Charity in the UK

With the establishment of Community Engagement Chapters, the establishment of the Clean Ganga UK charity has received a lot of support from the grass-roots and activated the necessary enabling environment. The charity set up process has been expedited and it will set up soon with a view to start mobilising communities and friends of Ganga in the coming months.







cGanga

Centre for Ganga River Basin Management and Studies

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