

IUKWC PROGRESS REPORT

YEAR 1

July 2017



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Water Centre
भारत-यूके
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IUKWC Progress Report

Year 1

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The India-UK Water Centre promotes cooperation and collaboration between the complementary priorities of NERC-MoES water security research.

भारत-ब्रिटेन जल केंद्र एमओईएस-एनईसीआरसी(यूके) जल सुरक्षा अनुसंधान के पूरक प्राथमिकताओं के बीच सहयोग और सहयोग को बढ़ावा देने के लिए करना है

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Foreword

The India-UK Water Centre (IUKWC) was established in 2016 to promote cooperation and collaboration in water security research by developing a platform for long-term partnerships and dialogue between Indian and UK water researchers, water policy-makers and water businesses. Funding from the National Environment Research Council (NERC), UK and Ministry of Earth Sciences, India (MoES) has supported the Centre's first year of activity.

Over the past twelve months the operational framework for the Centre has been put in place and initial activities have been funded and delivered. This report outlines the progress made in the first year and presents some initial indicators of uptake by the India-UK water science community.

The IUKWC is delivered by a joint Secretariat, based in the UK at the NERC Centre for Ecology & Hydrology (CEH) and in India, at the Indian Institute of Tropical Meteorology (IITM). It has been our pleasure to jointly coordinate the Centre for the last year. In addition to ourselves, a Secretariat team of experienced project managers, stakeholder engagement experts, administrators and web developers has been assembled to take forward the Centre. The co-delivery model between India and the UK has been shown to work well with the Secretariat collaborating closely despite the geographical detachment.

The Open Network of India-UK Water Scientists was launched by the Centre in September 2016 as a cornerstone of its efforts to engage the community. With over 350 registered members to date, the Open Network is proving a popular and useful tool for linking researchers across the two countries. Initiatives to engage the wider water stakeholder community are in development, including the collation of information on key organisations and individuals in a database.

At the heart of the IUKWC concept are a series of activities designed to facilitate partnerships between scientists. The Centre's first workshop was held in Pune in November-December 2016 on the topic of "Developing hydro-climatic services for water security". The event was well subscribed with participants providing strong feedback on the benefits to their research and international engagement. A bilingual State of Science Water Brief has also been produced summarizing the key findings from the workshop for stakeholders.

Following the success of the Pune workshop the first Open Call for delivery of the second workshop was launched. Numerous joint applications by Indian and UK scientists were put forward suggesting workshops on a wide range of topics. Current funding levels meant that the Centre could only support one workshop in the 6-12 month period and the selected proposal will see a workshop on the topic of Enhancing Freshwater Monitoring through Earth Observation held in Stirling in June 2017.

Alongside the call for workshop, the IUKWC also requested applications for funding under its Senior and Junior Researcher Exchange Schemes. The high level of applications and amount funding requested resulted in the Management Board deciding to fund five exchanges under this first call, instead of the originally envisaged two. At the time of writing these exchanges are underway with visitors in the UK and India. Initial feedback from participants has been good with a number highlighting direct benefits for future planned collaborations.

The IUKWC's User Engagement Initiatives focus on translating the results of India-UK science into policy/operational practice. An on-line survey was run amongst the Member of the Open Network to help design the initial User Engagement Initiative which is timetabled to take place over coming months. We see this approach of engaging the science community in the design, as well as delivery, of the Centre's activities as an important way of ensuring the support provided by the IUKWC results in sustainable benefits for researchers.

Through supporting a small number of Pump Priming Projects, the Centre is able to help develop early ideas into future collaborations. The projects are designed to take forward ideas or provide

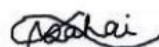
preparatory groundwork for future Centre activities. One unforeseen area of activities for the Centre in Year One resulted from additional funding made available by NERC in early 2017 which allowed support to be provided to two extra Pump Priming Projects – the ideas for which arose at the Pune workshop. The projects are delivering benefits for the Centre in the form of online webinars and will result in IUKWC Briefs on “The development of inclusive and stakeholder-led hydro-climatic services in India” and “Current opportunities and challenges in developing hydro-climatic services in the Himalayas.”

Underpinning all of the IUKWC’s activities are a series of Communication Platforms and activities. The last twelve months has seen the development and launch of the Centre’s website as a central hub for information, the creation of a corporate identity for the Centre and an active engagement with the IUKWC community through social media. Further development of online collaboration tools was made possible by the additional NERC funding and we look forward to seeing these launched soon to further engage the research community and support collaboration.

In closing our foreword to this first IUKWC Annual Report, we take this opportunity to express sincere gratitude to MoES and NERC for supporting what has been a very busy and successful first year of activity. We also thank the hundreds of water scientists and stakeholders from across India and the UK who have engaged in the IUKWC over the last 12 months, without their support and voluntary engagement the Centre would not function. We are confident the Centre is already providing tangible benefits to these communities and, in light of the levels of demand that we have observed in year one, we look forward to growing the breadth, depth and effectiveness of IUKWC activities in the coming years. In doing so we will ensure the Centre facilitates an increased impact and sustainable legacy for joint India-UK water science.



Harry Dixon
IUKWC Coordinator



AK Sahai
IUKWC Coordinator

IUKWC Progress Report: Year 1

The India-UK Water Centre (IUKWC) was established in 2016 by the National Environment Research Council, UK and Ministry of Earth Sciences, India (NERC-MoES). The Centre aims to promote cooperation and collaboration in water security research in order to establish a platform for long-term partnerships and dialogue between Indian and UK water researchers, water policy-makers and water businesses.

One years' funding was approved for the Centre with the possibility of extensions for a further two years', or more. This document reports on the India-UK Water Centre's first year of operation, documenting milestones and metrics accordingly, against the five overarching goals outlined for the Centre:

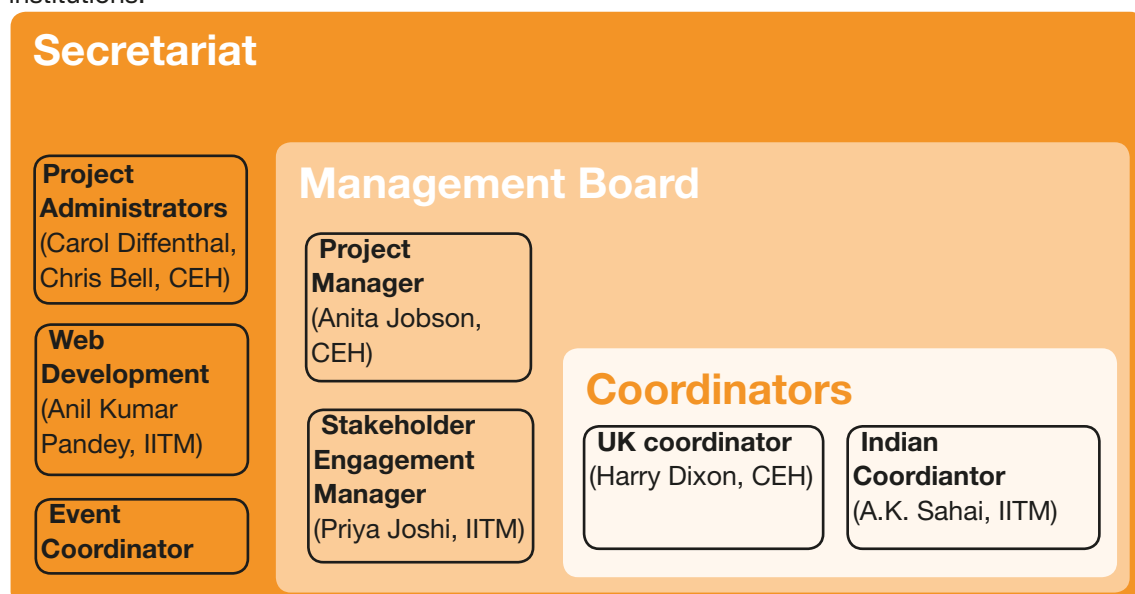
- ◆ To engage the community;
- ◆ To facilitate partnerships and build capacity;
- ◆ To enhance knowledge exchange;
- ◆ To support future India-UK collaborations;
- ◆ To develop effective communication platforms.

1. Centre Operations

1.1. A Joint Secretariat

An important feature of the IUKWC as a virtual joint centre for water security, is its co-delivery by a Secretariat based in the UK (at the NERC Centre for Ecology & Hydrology (CEH)) and in India (at the Indian Institute of Tropical Meteorology (IITM)). This collaboration in operating the Centre means that the day-to-day planning and delivery of IUKWC activities can draw upon on local knowledge, contacts and information about current research and water issues.

The Centre commenced operations in July 2016 led by a **Management Board**, jointly chaired by the **Centre coordinators**, Dr Harry Dixon (CEH) and Dr Atul Kumar Sahai (IITM) and supported by a **Project Manager** (0.3FTE Anita Jobson, CEH). In December 2016 a **Stakeholder Engagement Manager** (Priya Joshi, IITM) was recruited to the Centre. The Management Board's time is partially funded by the IUKWC with supporting in-kind funding from the coordinating institutions.



The Centre's Management Board is supported by a wider **Secretariat** team split across the two coordinating organisations. At the time of the Centre's establishment it was supported by one **Project Administrator** (0.2FTE Dr Carol Diffenthal, CEH). Due to the volume of activity in the IUKWC CEH subsequently seconded additional in-kind staff time for the Project Administrator activities in January 2017 (0.2FTE Chris Bell, CEH). The Centre originally sought to recruit an **Event Coordinator**, and in December 2017 recruited a staff member with **web development** skills to support the development of the Centre's online presence (Anil Kumar Pandey, IITM - recruited in December 2017). The Centre also calls on expertise from across the coordinating organisations to provide general in-kind support (administrative, financial, and communications).

The Management Board and Secretariat communicate formally via Management Meetings set approximately every 6-weeks and undertaken by Video-Conference. In between times there is frequent communication via email, skype, and VC as necessary. Face-to-face meetings have also taken place sporadically since the initiation of the centre coinciding with Centre activities.

1.2. Year 1 Delivery Timetable

The IUKWC's first year of operation has seen a wider range of activities both to establish the Centre and commence delivery of its outputs. The proposal put forward in 2016 included plans to hold events/activities as well as deliver operational milestones throughout the first year. The table below summarises the planned delivery timetable versus achievement.

Table 1. Delivery of planned activities and operational activities.

	Planned	Actual
1. Engaging the Community		
Open Network of Water Scientists	Launch Aug/Sept 2016	Sept 2016
Stakeholder Database	Establish Oct/Nov 2016	Delayed post-appointment of Stakeholder Engagement Manager; now underway
2. Facilitating Partnerships		
Open Calls	Oct/Nov 2016 April May 2017	Held Dec/Jan 2017 Delayed pending funding renewal
Science Workshop India	Oct/Nov 2016	Nov/Dec 2016
Science Workshop UK	Jan-May 2017	June 2017
Research Exchanges	Sept 2016-June 2017	Feb-June 2017
3. Enhancing Knowledge Exchange		
User engagement Initiative	Jan-Jun 2017	Summer 2017
4. Supporting Future		
Pump priming	Sept 2016-June 2017	Jan-Sept 2017
5. Profile and Communication		
Communication Plan developed	Jul-Aug 2016	Ongoing; Core plan developed
Web launch	Aug/Sept 2016	Sept 2016
Design templates	Sept/Nov 2016	Ongoing; Core templates designed
Newsletters	Sept-Dec 2016; Mar-Jan 2017	On hold

2. Engaging the Community

2.1. The Open Network of India-UK Water Scientists

The Centre's primary objective was to establish wide-ranging engagement across the Indian and UK water communities. The ambition was to not just to engage a large number but rather a diversity of individuals and organisations that covered a range of institutions, an extensive geographic spread and a range of career levels from PhD through to Senior Professor. The primary mechanism to establish this engagement was through the establishment of the **Open Network of India-UK Water Scientists**. The Open Network was established in September 2016, is an online, searchable¹ database of individuals and organisations based in the UK or India with research interests in water security. The network provides an open information source for researchers and is used by the IUKWC to disseminate communications, circulate calls for new activities and identify participants for commissioned activities.

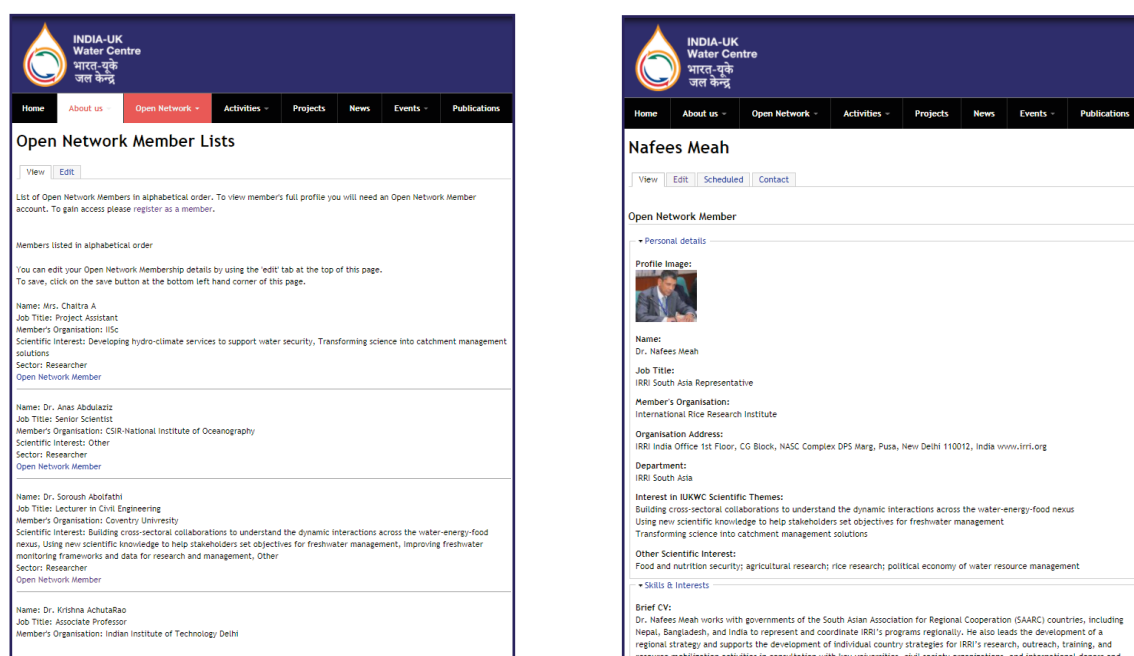


Figure 1. Screenshots of the IUKWC Open Network of Water Scientists. (L): summary of members; (R): member profile page

Figures 2 and 3 show the membership levels over time demonstrating the temporal acquisition of members both overall (Figure 2) and by country split (Figure 3). As of 19/04/17 there were 352 members; 229 Indian, 119 UK; with 1 from USA, 1 from Ethiopia and 2 from Sri Lanka.

The diversity of members institutionally and geographically is shown in Figures 4-6. The membership metrics demonstrate successful achievement of a diversity of members across institutions, and geography within the first year.

¹ Search functionality has been developed in spring 2017, however due to the UK pre-election rules we have not made it live; it will be available post UK Election June 2017.

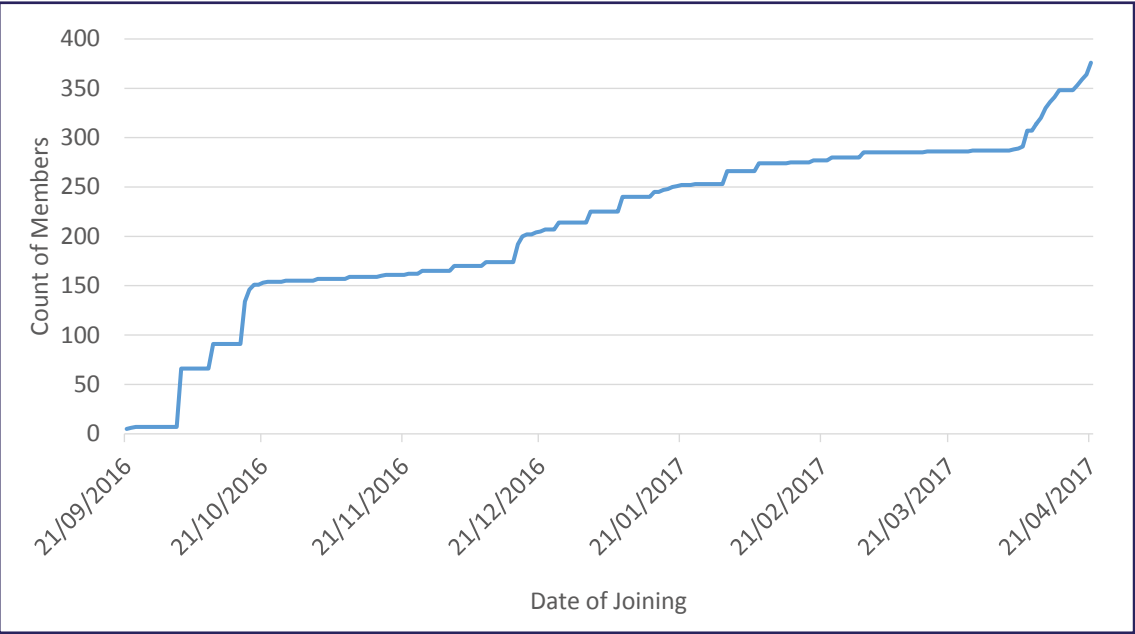


Figure 2. Open Network of Water Scientists membership by joining date

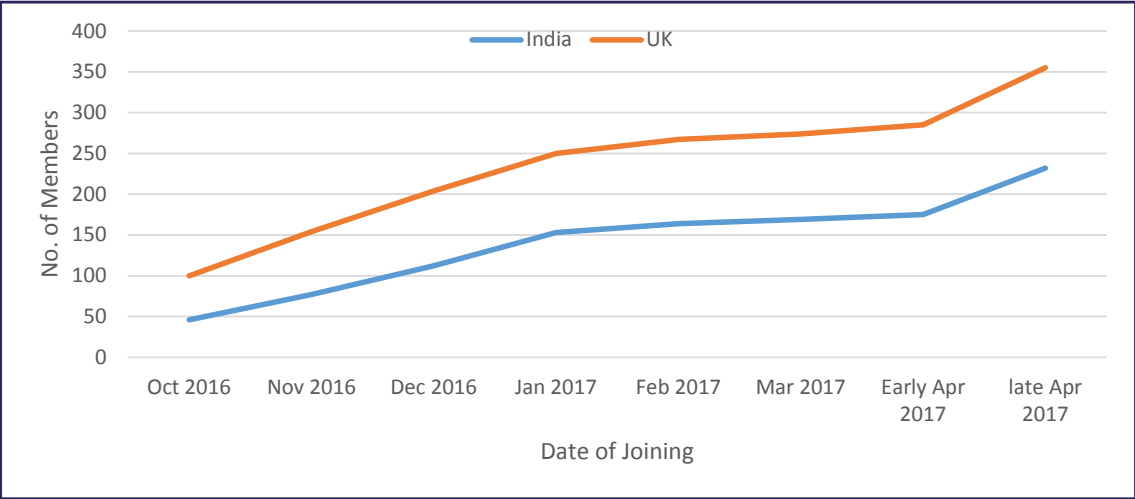


Figure 3. Open Network of Water Scientists: Membership by country

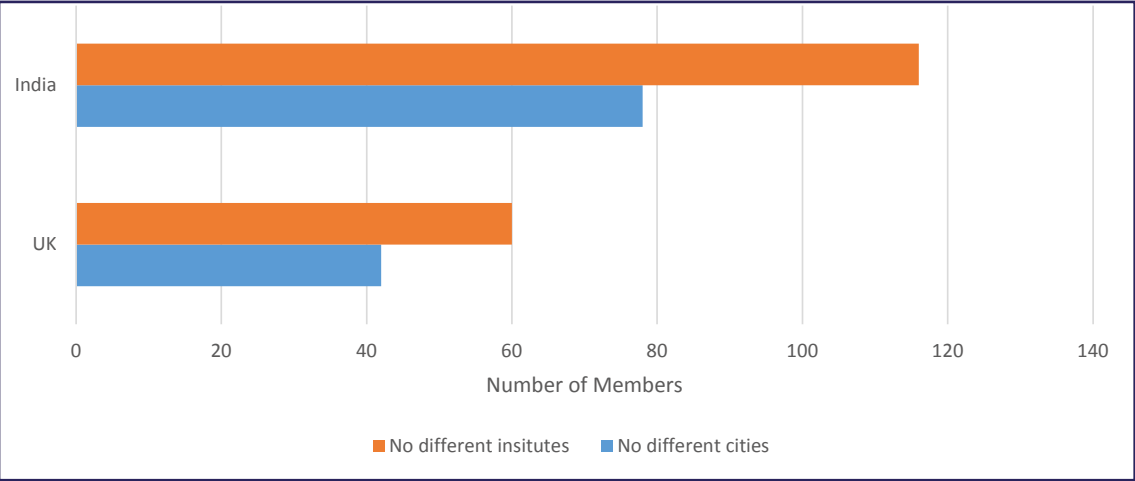


Figure 4. Open Network of Water Scientists: Diversity of Members Organisations and Cities

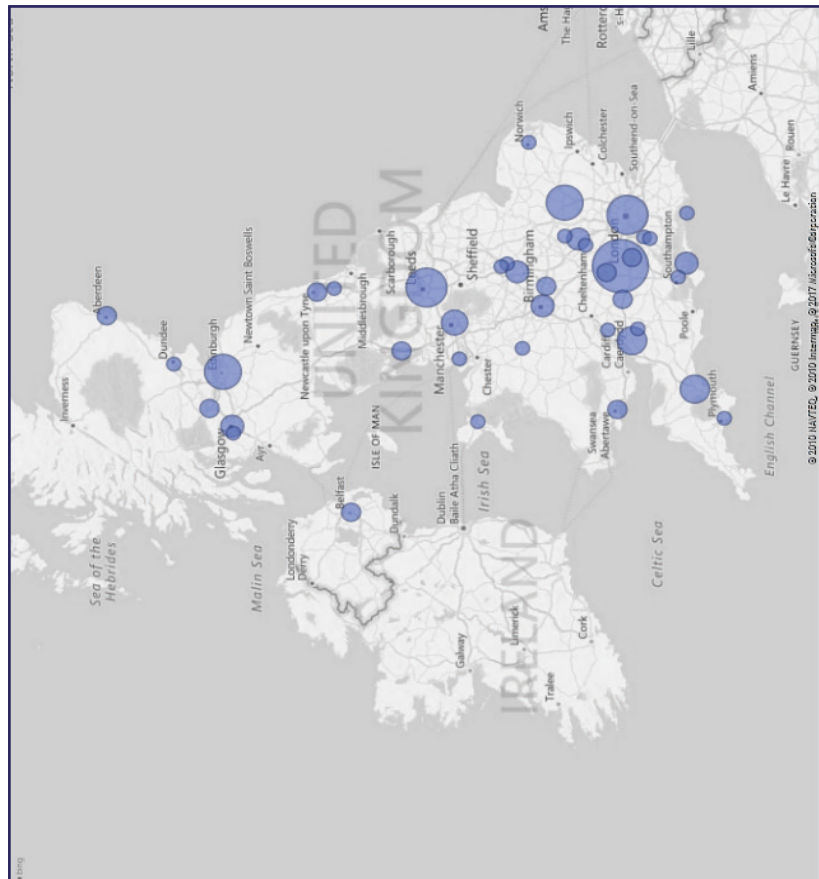


Figure 5. Open Network of Water Scientists; Membership by City, India. Size of circle relates to numbers of members in each city.

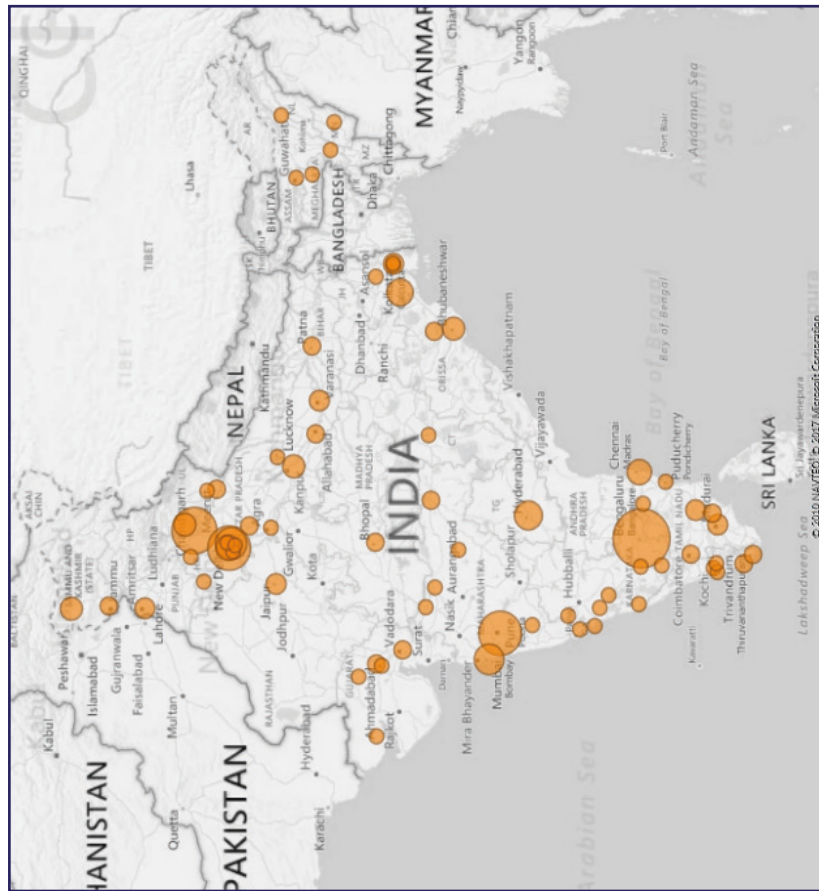


Figure 6. Open Network of Water Scientists; Membership by City, UK. Size of circle relates to numbers of members in each city.

2.2. Water Stakeholder Database

The planned database of different stakeholders in the water sectors of India and the UK is currently under development. The database will facilitate the IUKWC's understanding of the functioning of the water sector and help identify where there are potential linkages with other sectors (land use, agriculture, planning, energy, etc.). The database is primarily intended to accumulate information on various entities and their roles and will facilitate their interactions with the IUKWC and its activities and encourage co-production of research outcomes.

This database will be structured around nine categories of stakeholders identified by the IUKWC Secretariat (See Table 1). The database will contain information on key individuals, organizations, projects, focus areas, data availability, use of hydro-climatic services, gaps, needs, etc. for the nine stakeholder categories. The database is planned to evolve as upcoming stakeholders are added.

Table 1: Stakeholder categories for the IUKWC

No.	Stakeholder Category	Brief Description
1	Central level government and semi government organizations	<ul style="list-style-type: none"> Policy makers <ul style="list-style-type: none"> Entities of Ministry of Water Resources: River Development and Ganga Rejuvenation: Central Ground Water Board, National Water Development Agency Representatives of government water related sectors like disaster management, agriculture, energy, health, public works, /infrastructure, economy, finance, etc. <p>Scientists involved in decision making</p>
2	State- local government level	<ul style="list-style-type: none"> Policy makers and implementer's at a State/ district/ local scale (need targeted engagement mechanisms) State government bodies, municipalities, inter-municipal bodies, river basin authorities, regional development agencies, watershed authorities, etc.
3	Research organizations & Academia	<ul style="list-style-type: none"> Government, semi government & private research organizations Universities, colleges, etc.
4	Non- governmental organizations	<ul style="list-style-type: none"> Central, regional and local scale <p>Includes awareness, activism, research and policy orientation</p>
5	Private water supply sector	<ul style="list-style-type: none"> Private sector associated with water supply, water purification, filtration, etc. Businesses, small scale companies, etc.
6	Private water use sector	<ul style="list-style-type: none"> Private sector associated with power generation, waste water treatment, intensive water use, etc. Industries, Businesses, Corporate social initiatives, etc.
7	Public water use sector	<ul style="list-style-type: none"> Water users' associations, farmers associations, city rotary clubs, youth – women centred organizations
8	National/regional/ local: Water networks/ portals/ professional associations	<ul style="list-style-type: none"> International/ national/regional/local level platforms, networks and associations <p>India water week, India Water portal, Indian Association of Hydrologist events, British Hydrology Society events, etc.</p>

9	International organizations	<ul style="list-style-type: none"> International bodies associated with water security, research, management, etc. <p>FAO, Global Institute for Water, Environment and Health, UNDP Global Water Solidarity, Scientific Information Centre of Interstate Commission for Water Coordination in Central Asia, etc.</p>
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2.3. Stakeholder Engagement Plan

The UK coordination centre received additional funds from NERC Innovation Funding in January 2017. This funded an exchange by the Stakeholder Engagement Manager from India to UK. The focus of this visit was to meet with scientists at CEH to help progress strategic discussion around how to better engage with stakeholders in India and to learn about methodologies of stakeholder engagement in the UK water sector. The discussions with social and technical scientists from various interdisciplinary research fields revolved around efficacy and feasibility of current methods of stakeholder engagement practised in the UK and their applicability in the Indian scenario. Further, the discussions also expounded upon gaps in the current use and dissemination of hydro-climatic services in urban and rural settings both in India and the UK.

The visit proved to be highly productive in developing strategies for forthcoming projects and future planning for IUKWC stakeholder engagement activities. Without the exchange this rapid development in understanding and exposure to experts would not have been possible.

3. Facilitating partnerships

3.1. Science Workshops

Science workshops provide an opportunity for a 15-30 UK and Indian scientists to convene in a concentrated space and time to:

- Discuss the current state of knowledge in a particular area;
- Identify the future requirements/ideas for joint research and/or;
- Provide training to exchange and further develop scientific skills in water security science.

The Centre hosts workshops initiated either via a Focussed or Open Call. The first workshop, being the inaugural event for the Centre, was developed on a pre-selected topic. The Centre has since launched its first Open Call for which the community proposed topics.

First Workshop

IUKWC hosted its first scientific workshop on **Developing hydro-climatic services for water security** held at IITM in Pune, India 29th Nov– 1st Dec 2016. Convened jointly by the Indian Institute of Tropical Meteorology and the Centre for Ecology & Hydrology (CEH) for IUKWC, the workshop was led by Dr. Atul Sahai, IUKWC India Centre coordinator and Dr Harry Dixon, IUKWC UK Centre coordinator.

The workshop brought together scientists to explore the scientific challenges involved in the production, translation, distribution and use of climate information and tools to inform decision-making in the Indian and UK water sectors. The full Activity Report documenting the workshop can be found on the IUKWC website: <http://www.iukwc.org/activity-report-developing-hydro-climatic-services-water-security>. A separate, bilingual, **State of Science Water Brief** has also been produced summarizing the key findings from the workshop for stakeholders. However, the timing of production coincided with the UK pre-election period restrictions and has been unable to be made available on the IUKWC website until post-election restrictions are lifted.

A call for attendees was advertised via the IUKWC website and 48 applications were received (16 UK, 32 India). All Indian applicants were accepted, 1 UK applicant was declined and 2 applicants offered a place at the workshop were unable to attend. With additional invited speakers and dignitaries, a total of ~ 60 delegates attended the workshop (14 UK, 46 India). A goal of the Centre is to engage with users from a diversity of institutions and locations. At the first workshop a total of 36 different institutes were represented from 24 differing cities (UK and India) (Figure 7 and Figure 8).

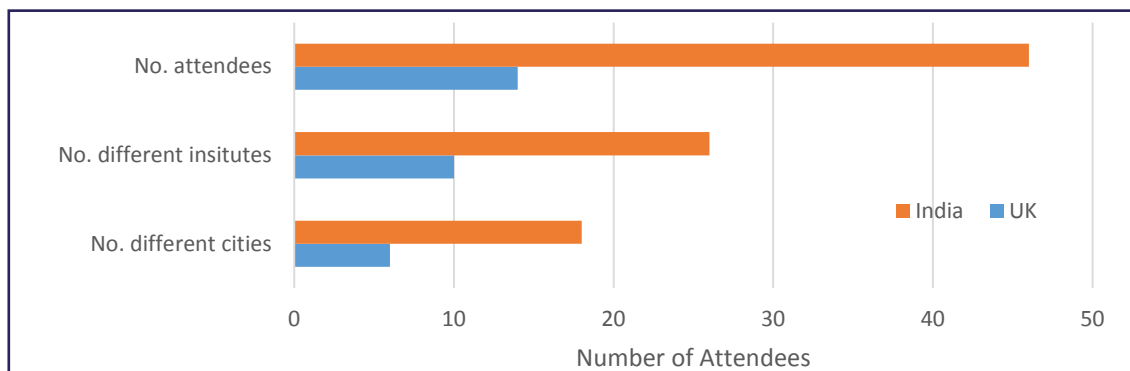


Figure 7. Geographic and institutional diversity of attendees

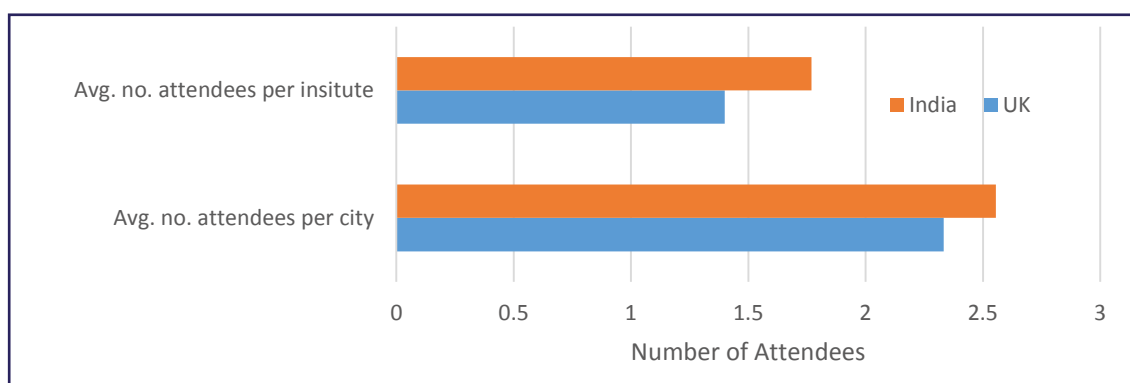


Figure 8. Geographic and institutional balance of attendance

In order to establish whether the Centre's initiatives meet the needs of users, a feedback process has been established for those taking part in IUKWC activities. A key goal of the India-UK Water Centre is to provide a platform for bringing together users, researchers and stakeholders in water science, it was thus pleasing to note that 95% of those completing the feedback form stated that they had made new contacts as a result of the workshop with potential opportunities for future collaboration with the new contacts (Figure 9).

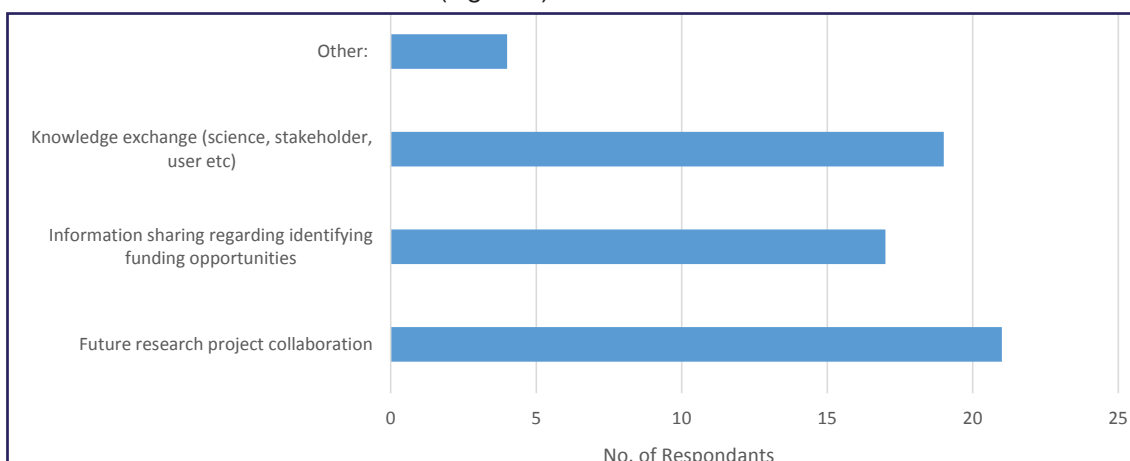


Figure 9. Participants identified the potential outcomes from new contacts made during the Workshop

Participants identified ways in which joint UK-India capacity in the area of hydro-climatic services could be taken forward and these included provision of continued opportunities for linkages between disciplines and between researchers and users/stakeholders. Methods to facilitate the continued and increased linkages included, further events such as workshops, exchanges and training opportunities in various aspects of hydro-climatic services such as flood forecasting, modelling, downscaling etc. **Overall participants scored the workshop on average 9/10.**

“It was probably the best content/structure of a networking meeting that I have been on. Scientists from both sides exchanged views/experience and was not exclusive meeting of two different nations - it was very mixed”

Open Call for organizing workshops

The first Open Call for members to propose and lead a workshop to be held in the UK was opened on the 15th December 2016, hosted on the IUKWC website. Eight (joint UK-India) applications were received for the call by the closing date of 31st January 2017 (Table 2). The Secretariat evaluated the applications based on:

- ◆ Relevance/Fit of the proposed workshop to the scientific scope of the Centre;
- ◆ Timeliness of the proposed topic of the workshop;
- ◆ Capability of the Activity Leads to carry out the Workshop;
- ◆ Relevant expertise of the Proposed Activity Leads;
- ◆ Anticipated added value the workshop would add to the Centre’s aims and to the Activity Leads;
- ◆ Risk to successful delivery.

Table 3. Proposed Workshop Topics from Open Call applications December 2016.

No.	Proposed Workshop Topic	Proposed Location
1	Enhancing freshwater monitoring through Earth Observation	Stirling, UK
2	The science of eco-engineering for resilient water systems: Global learning for local applications	Bristol, UK
3	Citizen science, participatory data collection, and stakeholder engagement for integrated water management in India	London, UK
4	UNSURE: Understanding NexuS Uncertainties and Risks in the Environment	London, UK
5	Developing catchment management plans for semi-arid basins undergoing global change	Cambridge, UK
6	Decision Support System for Integrated Fresh Water Management	Cranfield, UK
7	Workshop on CEPA (Communication, Education, Participation and Awareness) Programme implantation for Wetland Conservation	London, UK

The successful workshop selected, (based on scoring highly across all areas of assessment) was proposed by Prof Andrew Tyler (University of Stirling UK) and Prof Mihir Kumar Dash (IIT Kharagpur) on the topic of *Enhancing Freshwater Monitoring through Earth Observation*. The workshop will be held in Stirling, UK 19-21st June with the aim to bring together scientists to explore the latest generation of Earth Observation (EO) capabilities in the Indian and UK water sectors covering topics including differing practices in India and the UK in monitoring water quality of freshwater; current and near future EO data products available for freshwater monitoring; practical applications to enhance water security, for example to improve water resource quantity and quality for water supply, agriculture and aquaculture; and synergies and opportunities to

develop and exploit EO capability for effective early warning of freshwaters.

A call for attendees was advertised via the IUKWC website; opening on the 6th April 2017 and closed on 20th April. A total of 75 applications were received (5 UK, 70 India). For the UK participants, 3 applications were accepted and 2 were declined. In order to increase the UK participation levels relevant individuals in the UK science community were identified by the Activity Leads and also via a search of NERC Grants on the Web. Targeted invitations were then sent to an additional 14 individuals. From India 10 applications were accepted, with 5 invited speakers. It is anticipated that the final delegation will be ~45 attendees once Activity Leads/organisers and invited dignitaries are included.

3.2. Researcher Exchanges

The IUKWC Research exchange program offers an opportunity for researchers at different stages of their academic career to collaborate with scientists from the partner countries to develop new projects and further the cause of water security. This funding opportunity is aimed at building on NERC-MoES research, and facilitating new collaborations in the five IUKWC theme areas. The IUKWC supports Senior Researcher Exchanges and Junior Researcher Exchanges.

The Centre's' first Open Call for researcher exchange was launched on the IUKWC website on 15th December 2016 with applications closing 31st January 2017. The Secretariat reviewed the nine applications received based on:

- ◆ Fit to the scientific scope of the Centre;
- ◆ Timeliness of the topic;
- ◆ Risk of successful delivery;
- ◆ Capability of the individuals to carry out the exchange;
- ◆ Relevant expertise of the individual;
- ◆ Anticipated added value.

The budgeted plan was to award one exchange from UK to India and one exchange from India to the UK. Based on the applicants requested levels of funding the Secretariat was able to select five candidates for the first round of the exchange programme (Table 4). The exchanges are planned to be conducted during the period April–June 2017.

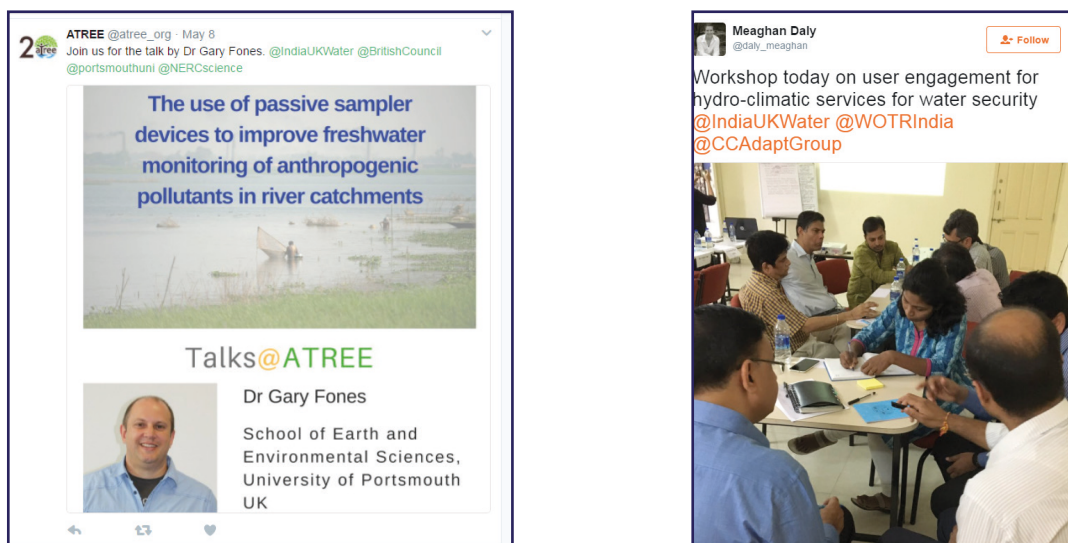


Figure 10. Tweets relating to the IUKWC exchanges

Table 4. Applications for Researcher Exchanges 2017

	Applicant	Host	Junior/ Senior	Title	Funded?
Applications for exchange to India					
1	M.Daly, U of Leeds	C. Lobo; WOTR	Junior	Consolidating Learning About Stakeholder Engagement Across Research and Practice: Toward the Development of Hydro-climatic Services	Yes
2	G. Fones; U of Portsmouth	P. Jamwal; ATREE	Senior	The use of passive sampling devices to improve the monitoring of anthropogenic pollutants in river catchments in India	Yes
3		IISC	Junior	Will future water demand thresholds in the Ganges basin be exceeded?	No
Applications for exchange to UK					
4	S.Sen; IIT Rorkee	A. Momblanch; Cranfield University	Junior	Ecosystems Services Assessment and its Implementation in UK	Yes
5	Chandra Rupa; IISC	G. FU; U of Exeter	Junior	Quantifying resilience of water infrastructure to extreme precipitation events in urban areas	Yes
6	N. Tyagi; IDC Foundation	L. Mehta; U of Sussex	Senior	Understanding the Water, Energy and Food Security Nexus to Design Technology and Policy Approaches for Enhanced Adaption to Climate Change in India	Yes
7		U of Birmingham	Junior	Improving Indian hydro-climate forecasting capabilities for extreme precipitation events	No
8		BGS	Senior	High Resolution Observations of Groundwater Fluctuations in Punjab, India	No
9		Not identified	Junior	Unknown	No

4. Enhancing Knowledge Exchange

4.1. User Engagement Initiatives

The plan for User Engagement Initiatives (UEI) at IUKWC is mainly focused at translating the results of India-UK science into policy/operational practice. These initiatives are designed to bring together scientists, policy makers and stakeholders (such as regulators, commercial companies, grass-root communities) to support:

- a) The translation and communication of India-UK water security science to users;
- b) Collection of input on stakeholder needs for future research and innovation.

IUKWC plans to host its first UEI in the form of an exposure workshop tentatively during June 2017. The first UEI will be designed based on participation and feedback from the members of its 'Open Network of India-UK Water Scientists'. An online poll is currently being conducted amongst the IUKWC Open Network members to elect a theme for the first UEI as well as select the stakeholder category for which the initiative will be conducted. The initiative itself is planned to be in the form of an exposure workshop between the elected stakeholder category and a customized expert panel.

The following three stakeholder categories and three IUKWC themes have been shortlisted for consideration by Open Network Members, based on timeliness, gaps identified in previous workshops and feasibility options.

Shortlisted stakeholder categories:

- ◆ Regional - local government level;
- ◆ Private Water use sector;
- ◆ Public water use sector: Associations.

Shortlisted IUKWC Themes:

- ◆ Building cross-sectoral collaborations to understand the dynamic interactions across the water-energy-food nexus;
- ◆ Using new scientific knowledge to help stakeholders set objectives for freshwater management;
- ◆ Transforming science into catchment management solutions.

The resulting User Engagement Initiative is intended to initiate a dialogue between stakeholders and scientists to address the selected theme and associated gaps and needs for future research. The workshop plans to identify key categories in which the future research, needs to be driven in the water sector and further the cause of coproduction of research outcomes. Further, to benefit the overall engagement process the UEI aims to identify the stakeholders' key responsibilities, their stakes, core motivations and scope for building scientific capacity. An IUKWC Water Brief will be produced detailing the outputs of the UEI.

5. Supporting future collaboration

5.1. Pump Priming Projects

The Centre's activities are expected to result in a significant number of ideas and recommendations for future India-UK collaborations related to water security. In order to support the conversion of these early ideas into future collaborations and joint research ideas, the Centre funds Pump

Priming Projects which are designed to take forward ideas or provide preparatory groundwork for future Centre activities.

In January 2017 the UK coordination centre received additional funding via NERCs Innovation Funding which enabled two additional Pump Priming Projects to be undertaken (see Table 4), outcomes of ideas generated at the first Workshop. Both project are currently underway and will result in Activity Reports and IUKWC Briefs which will benefit the Centre's wider community.

Table 4. Additional Pump Priming Projects funded by NERC Innovation funds

Lead	Title	Summary	Partners
Z. Bharucha; Anglia Ruskin University	Ways of optimising new hydro-climatic services for stakeholders	The project will review current practices, challenges and future opportunities relating to the development of hydro-climatic services (HCS) used to predict, manage and communicate water scarcity in drought-prone environments in India. The goal is to support the development of <i>inclusive</i> and <i>stakeholder-led</i> tools.	Dr. Rajib Chattopadhyay, IITM, Pune; Dr. Jagdish Krishnaswamy, ATREE, Bangalore; Dr. Michael Green, Global Sustainability Institute, Anglia Ruskin University; Dr. Ajay Bhawe, Sustainability Research Institute, University of Leeds.
M. Widmann, University of Birmingham	Current opportunities and challenges in developing hydro-climatic services in the Himalayas	This activity will assess the significant issues for hydro-climatic modelling and service development in the mountain regions of northern India. It will provide a comprehensive review of the relevant scientific literature, of current modelling capabilities, as well as of the availability	Dr. J. Sanjay and Dr K.P. Sooraj, IITM, Pune; Dr. E.N.Rajagopa and Dr. A. Mitra, NCMRWF, Noida; Prof. A. Karumuri, University Hyderabad; Dr A. Orr, BAS, Cambridge; Prof. D. Hannah and Dr. A. Van Loon, University Birmingham.

One additional Pump Priming Project was intended to be funded from the IUKWC core-budget during the first year. The Centre's Management Board decided to delay the setup of this project until after the second workshop and first round of Researcher Exchanges and at the time of writing are exploring a possible project to be run during the summer.

6. Developing Effective Communication Platforms

6.1. Communications Plan

The IUKWC considers an active programme of open on-line, face-to-face and print communication activities to be a key part of engaging the community in its activities. The IUKWC's Communications Plan is a living document that sets out the methods the Programme uses to raise awareness of the Centre amongst, disseminate information to, and engage with, the water security community in India and the UK (the community being defined as Indian and UK water researchers, water

policy makers and water businesses). Specifically, the communications plans describes actions to:

1. Raise awareness of IUKWC among the community;
2. Recruit members to the Open Network;
3. Engage with and disseminate information to the community.

Communications Channels and Audience

The following channels are in use, or will be used, to achieve the IUKWC communication objectives:

- Online hub – the IUKWC website provides information on calls, events calendar, outputs and reports and a searchable database of India-UK Water scientists and stakeholders. This aims to both engage existing and recruit new community members (see also Section 6.3);
- Networking and engagement events/meetings – these face-to-face communication activities to raise awareness and recruit new Open Network members;
- E-newsletter – to be sent periodically to registered members, the IUKWC newsletter and email notifications are used to disseminate relevant information about the Centre’s activities and outputs (see also Section 6.5);
- Social media – an active social media presence via the Twitter and LinkedIn platforms is used to raise awareness and engage both new and existing Open Network members (see also Section 6.4);
- Third-party communication channels – the Centre aims to exploit existing organisational communications channels to reach new audiences.

The primary audiences the IUKWC has focussed on in Year 1 are:

Audience	Primary Channel for Engagement of that Audience
Research scientists (India & UK)	Hub, events, face to face, reports, social, newsletter, 3 rd party publications/professional bodies
Policy-makers (India & UK)	User engagement initiatives
Water businesses (India & UK)	Newsletters, User engagement initiatives
Public (worldwide)	Website, social media

Communication plan monitoring and evaluation

The Programme is still developing metrics which will effectively monitor the success of our communication and engagement activities. A number of key metrics are presented in this report including:

- Number of members in the Open Network over time (including sub-metrics to identify diversity of scientific interest, location, organisation) (see Figures 2-6);
- Audience reach: for example social media followers and impressions (see Figures 13-14);
- Visits to and effectiveness of website materials: overall traffic and unique visitors (and sub-metrics of distribution and website page usage and drop-out rates) (see also Figure 12). Still under development is a way to determine number of open network members and third parties accepting & sharing information the IUKWC makes available.

We are also exploring the use of collaboration proxies such as recording numbers of new connections made (for example, pre and post events), measured from delegate feedback forms and the numbers of collaborative proposals/papers that might be derived from IUKWC activities.

6.2. Branding

The original proposal referred to establishing a “India-UK Virtual Joint Centre on Water Security”, which upon advice and approval from the Steering Group was renamed the “India-UK Water Centre”. The Centre has since created a logo, document templates (letterhead, generic documents, reports, briefings), and marketing material (website, postcards, brochures, pop-up banner, pens) with a consistent look.

These materials are used by the Centre in advertising calls and other business; whilst templates are will be provided to Activity Leads for preparation of activity documents, reports and briefs.

6.3. Website

The IUKWC website (www.iukwc.org ; Figure 11) was launched in September 2016 to coincide with the call for participants at the first workshop. The website includes information about the Centre, its activities, related NERC-MoES projects and, publications from the Centre (e.g. reports and briefs) and other related matter.

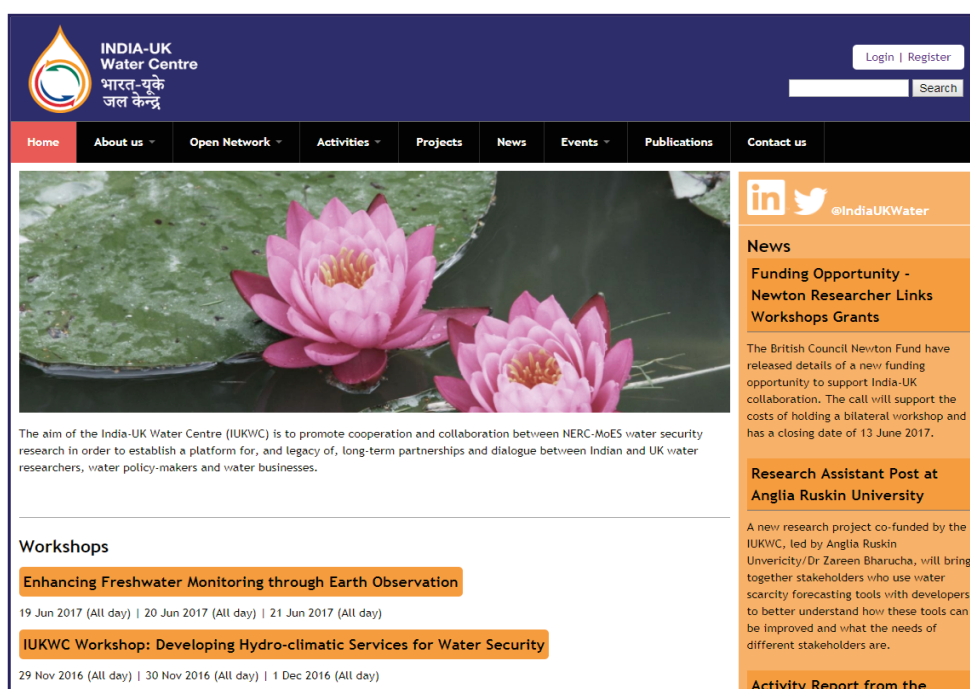


Figure 11. Screenshot of the IUKWC website home page

The website hosts the Open Network of Water Scientists database. The majority of the website's content are available to the general public but some content is restricted to registered members of the Open Network – e.g. ability to view member profiles, access to application forms for calls. This ensures that Members gain additional benefits from registering.

As a result of the NERC Innovation Funding provided to the IUKWC in early 2017, the functionality of the website also now includes the ability to embed functionality from other tools such as Slideshare (to disseminate Workshop presentation); BOS online surveys (to collect input and feedback from Open Network members) and Gotowebinar (to host online events).

The content on the website is incrementally increasing, understandably there is a time lag in establishing the Centre, hosting activities and content being generated from these activities for inclusion; as such it is anticipated that increasing content will be added to the website over future years.

The website is enabled with Google Analytics to help the IUKWC monitor user access and statistics. Key data are presented in the report in Figure 12.

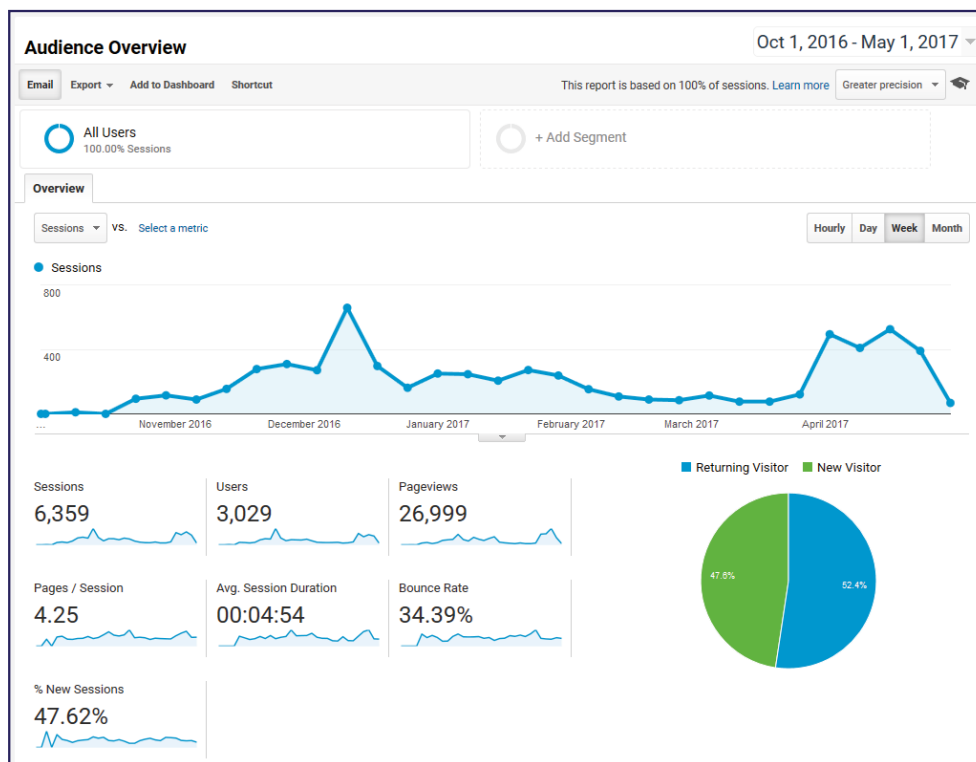


Figure 12. Google Analytics for the www.iukwc.org website.

In January 2017 the UK side of the IUKWC Secretariat received additional funding from NERC innovation funding which supported an exchange by the Website Developer based at IITM to the UK. The Centre website is hosted by an external company and developed through ad hoc in-kind support from a CEH web team. The skills and time of this dedicated Web Developer meant that the opportunity to develop online tools and capabilities, to enable members to interact more readily, might be delivered through the Centre's website on a faster timescale than otherwise achievable. The exchange visit enabled, through interaction with the local web hosting and CEH web development teams, an assessment of the feasibility of the Centre hosting available tools, establishing how such tools and modules could be integrated with the existing website and provided training on how to setup and maintain these in line with NERC's systems and policies as the host of the website. As part of the process of achieving this the exchange enabled an understanding of the required and available modules and different interfaces possible through the CEH web hosting platform working in Drupal 7 and 8.

At the time of writing, the current web development activities are focused on:

- ◆ translating the India-UK Water Centre website to Hindi (Figure 13);
- ◆ online discussion forums (see also Section 6.4);
- ◆ developing and populating a searchable library on the website to hold all Centre publications, documents and event material.

These enhancements are on hold for release until the UK election restrictions are lifted.

Future upgrades planned in the near future include:

- ◆ a live calendar of events;
- ◆ web-casting some of the Centre's activities (particularly presentations from workshops) in either real-time or recorded mode;
- ◆ a virtual meeting space for online meetings and web forums.



Figure 13. Screenshot of Hindi version of website

The additional funding provided to the UK coordination centre via NERCs Innovation Funding in January 2017 allowed the IUKWC Secretariat to investigate and develop tools to foster online collaboration amongst Members of the Open Network of India-UK Water Scientists (see also Section 6.2).

Based on feedback received from participants at the first workshop, the Secretariat commenced development of an online discussion forum as part of the IUKWC website. Workshop participants were of the view that such functionality would enable them to easily continue communication with those they had met and take forward open discussions of key issues. Though the additional NERC innovation funds the Web Developer was able to visit the UK and work with members of the CEH applications development team to develop this new functionality for the website. The discussion forum is due for launch after the UK election restrictions are lifted in June 2017.

In addition to a web-based discussion forum, the Secretariat have been testing tools which allow online web-casting of presentations. It is hoped that this new capability will allow the Centre to host online meetings whereby presenters in either India or the UK can give talks to a wider audience and take questions over the web. This functionality will be made available to Activity Leads who will, for example, be encouraged to use it to host meetings during Research Exchanges or disseminate the results of Pump Priming Projects.

6.4. Social Media

In tandem with the establishment of the IUKWC website social media presences have been established on Twitter (@IndiaUKWater) and LinkedIn in September 2016. To-date the Twitter account is proving a valuable and well-use medium for notifications and communication to a wide community of interested individuals and groups.

As of the end of April 2017 the Twitter account had accumulated 169 followers (Figure 14) with these key metrics:

- 💧 69% Male, 31% female
- 💧 50% UK; 34% India; 16% rest of world
- 💧 124 are individuals; 45 organisations/groups
- 💧 48 are also members of the Open Network.

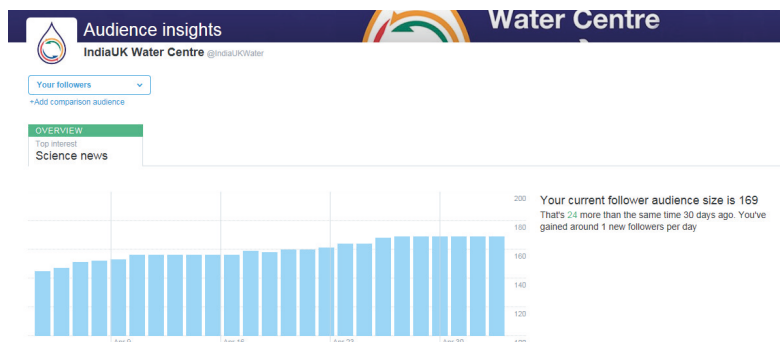


Figure 14. Twitter membership numbers over time

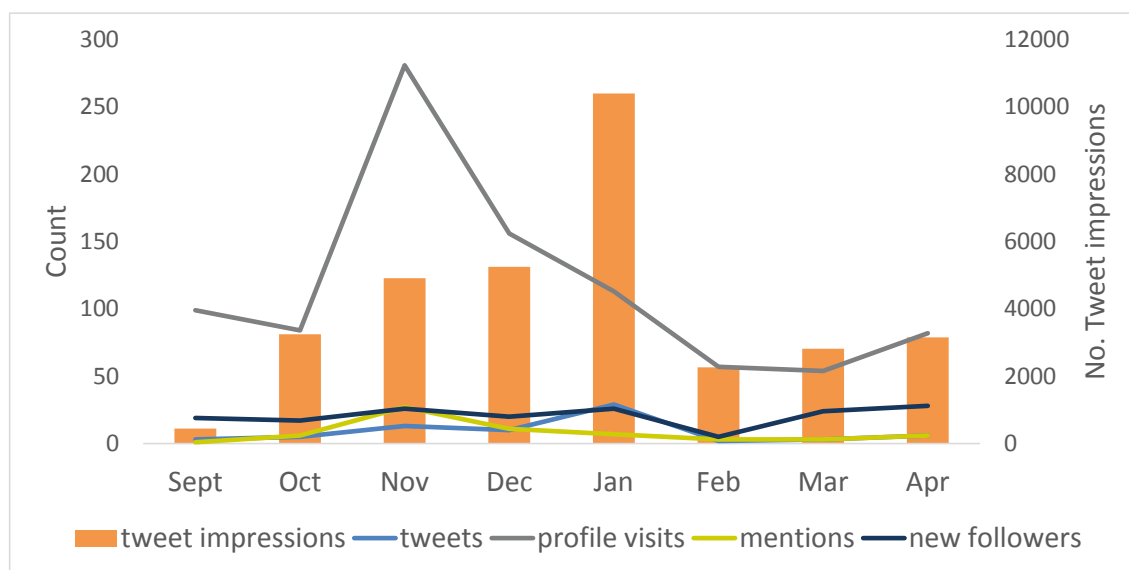


Figure 15. Twitter Analytics: September 2016 - April 2017. Legend: Tweet impressions: number of times our tweets are seen; Tweets: number of posts by us; Profile visits: number of visits to the @IndiaUKWater Twitter profile; Mentions: Number of times @IndiaUKWater is mention directly within another tweet; New Followers: new followers of the @IndiaUkWater account

6.5. Newsletter and email notifications

In the original proposal the Centre proposed a plan to circulate a quarterly newsletter to promote the centre and its activities etc. However, feedback from members has suggested this may not be an effective, or desirable communication method. Informal feedback from members indicates that individuals receive a surplus of communications from the wide variety of sources they are signed up to or are interested in and this overload often has the counter-effect of meaning many items are overlooked, ignored, or missed. Thus far the centre has focussed on targeted email campaigns and social media to alert members of specific activities and news rather than a newsletter of general updates at regular intervals. This appears to be well received, however we will take the advice from the Steering Group as to whether this should be reconsidered.

6.6. Events

The IUKWC continues to look for ways of maximising the reach of its activities through the use of web-based tools (see above) and face-to-face engagement at community events. Maintaining an IUKWC presence at relevant community events in both the UK and India is seen as a key way of maximising the exposure of the Centre, attracting new scientists to join the Open Network and ensuring visibility for the Centre's funders and outputs. It was felt important to ensure that the Centre was setup and ready to support the Community before embarking on an extensive campaign of publicity and therefore engagement in events has been limited in Year 1. The IUKWC Coordinators did however attend the NERC-EPSRC-DST Water Quality Workshop (November 2017, New Delhi) and the Secretariat have now begun a process of identification of events where it would be beneficial for the Centre to attend and hopes to scale up this activity in Year 2.



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