

Ecosystem Services Assessment and its Implementation in UK

Report of Researcher Exchange May–June 2017

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INDIA-UK
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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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Executive Summary

This report represents an overview of the activities and conclusions of a Junior Researcher Exchange undertaken at Cranfield University between 15th May and 2nd June 2017, and convened by Sumit Sen (Indian Institute of Technology, Roorkee, India) and Andrea Momblanch (Cranfield University, UK). It outlines the aims of the exchange, describes the programme and the activities developed to meet the objectives, and details the outputs generated, as well as the ongoing and future collaboration. Finally, it assesses the support received from the IUKWC through the Researcher Exchange Scheme. The present report is intended for India-UK Water Centre members and water security stakeholders.

1. Activity Leads

The Researcher Exchange was convened by the India-UK Water Centre (IUKWC) and led by:

Lead Researcher:

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The Exchange was held at Cranfield University, UK 15th May–2nd June 2017.

2. Activity Aims

The India-UK Water Centre is based around five key cross-sectoral themes and aims to deliver a portfolio of activities across these themes. This activity cuts across two themes: *Transforming science into catchment management solutions* and *Improving freshwater monitoring frameworks and data for research and management*.

The Researcher Exchange aim was threefold. Firstly, it focused on learning about the Ecosystem Services Assessment frameworks and tools through the UK example, for their implementation in an experimental watershed in Western Himalayas instrumented by the visiting researcher. Secondly, the exchange intended to establish a mutual area of research for future collaboration, with special focus on the integration of hydrologic ecosystem services into catchment management. Finally, it aimed to understand the latest instrumentation for collection and management of hydrological data and information. These could be broken down into the following specific objectives:

- Learn about big ecosystem services initiatives in the UK, hydrologic and high elevation ecosystem services, and the main tools for ecosystem services assessment.
- Define and develop an ecosystem services assessment in a selected watershed based on existing tools/models, analyse the impact of catchment management measures to inform watershed development projects, and outline a paper about it.
- Design activities for future collaboration: course proposal for the Global Initiative for Academic Networks, and PhD and Master projects.
- Meet part of the Cranfield Water Science Institute academic staff and deliver a presentation.
- Visit to Centre for Ecology and Hydrology's monitoring sites.

3. Activity Structure

The Exchange had an initial phase devoted to sharing information and planning in detail the work to do during the three weeks, followed by a time to individually analyse the information. An initial coordination meeting was held to discuss the case study data, the selection of target ecosystem services and the tools to assess them, and definition of the preliminary aims of the study and the subsequent paper. The agreed points were further discussed with the leader of the Catchment Management group, Prof. Ian Holman, to develop a final working plan.

Most of the exchange period was devoted to work on the case study. This activity included the acquisition of missing data and data preparation for the ecosystem services assessment, and the calibration and simulation of models. It required some time to share knowledge about the selected models, becoming an inter-training activity. It is worth mentioning that the time available to develop the whole activity was not enough to complete it, and a post-exchange work plan was agreed. However, the outline of the paper describing the study was written to be completed when the final results are available.

In line with the specific objectives of the Researcher Exchange, another activity consisted in designing a course proposal to apply for funds from the Global Initiative for Academic Networks. Some time was spent revising the requirements for course proposals and designing the course with a topic aligned with the exchange. The proposal will be submitted once the next call is opened, by the end of 2017. Moreover, the possibility to co-supervise thesis that apply the exchange modelling approach to other watersheds was also discussed and agreed, although this was defined as an ongoing and evolving process depending on the interests of the students and funding opportunities.

During the exchange, there were several opportunities for the Lead Researcher to meet and interact with other academics of the Cranfield Water Science Institute. An informal meeting was arranged with the 'Catchment Management' and 'Water for Food' research groups to talk about common research interests and possible collaboration options. Moreover, a formal presentation about current and past research was given to the whole Cranfield Water Science Institute team during their monthly seminar.

To conclude the exchange, the Lead Researcher visited the Centre for Ecology and Hydrology (CEH) in order to gain insight about watershed instrumentation technologies, setup and maintenance through meetings with other researchers working on the topic of hydrological monitoring in experimental catchments. Two days at CEH were focused on meeting with scientists working on different Indo-UK collaborative projects, viz. UPSCAPE (Upscaling Catchment Processes in Peninsular India) and a project with National Institute of Hydrology (NIH), Roorkee; and various hydrological models, for example grid-to-grid GWAVA models were explained during the meetings. An idea on developing a collaborative project was discussed with Dr. Harry Dixon, Group Leader, Water Resources Assessment at CEH.

The detailed programme of the Exchange is included in the Annexes.

4. Activity Conclusions and Outputs

The Researcher Exchange activity described in the present report is very positively regarded. It has provided valuable outcomes for the researchers involved and to move towards the integration of Ecosystem Services and Hydrological sciences in India. A long lasting impact by means of future collaboration and practice expansion is foreseen.

4.1. Key outcomes arising

The primary motivation of the Exchange was the recognition of the potential of Ecosystem Services Assessment as a tool to align sustainable catchment management and the provision of fundamental services to population, together with a gap in its implementation in India. In that sense, the exchange has contributed to address the gap by providing an application example to inform watershed development projects.

A notable outcome of the exchange is the outline of a paper that, once finished, will be submitted to a peer-reviewed journal, with explicit acknowledgement to the IUKWC funding. This comes together with the knowledge and capacity building exchange between the Lead and Host researchers.

Finally, if the course proposal is successfully funded by the Global Initiative for Academic Networks, the impact of the exchange will increase significantly. Being addressed to scientists, in-service engineers and researchers from industry, municipalities, non-government organizations, government and research institutes, as well as to students at all levels or faculty members, the course will further contribute to close the gap in the practical application of Ecosystem Services for decision making related to catchment management in India.

4.2. Conclusions and next steps/recommendations from the activity

Overall, the Researcher Exchange was highly beneficial for the Lead and Host researchers providing not only new knowledge and skills to both parties, but also establishing a solid relationship and understanding that will enhance future collaboration. It is especially positive for early career researchers that have limited funds to do this type of research travel and creating their contact networks.

An accompany Brief summarizing the key thematic points arising from the Activity can be found at www.iukwc.org

5. Annexes

15 May	16 May	17 May	18 May	19 May	20 May	21 May
- Work planning meeting	- Data acquisition and preparation	- Work plan discussion with Ian Holman - Data acquisition and preparation	- Modelling work on the case study	- Modelling work on the case study		
22 May	23 May	24 May	25 May	26 May	27 May	28 May
- Modelling work on the case study - Informal meeting with some academics	- Modelling work on the case study	- Modelling work on the case study	- Modelling work on the case study	-Presentation at the monthly seminar of the institute - Preparation of GIAN course proposal		
29 May	30 May	31 May	1 June	2 June	3 June	4 June
- Preliminary analysis of the modelling results - Paper outline	- Modelling work on the case study	- Modelling work on the case study - Preparation of GIAN course proposal	- Visit to the Centre for Ecology and Hydrology	- Visit to the Centre for Ecology and Hydrology		



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