



Sustaining Water Resources for Food, Energy & Ecosystem Services in India Announcement of Opportunity

1. Summary

The UK Natural Environment Research Council (NERC) and India's Earth System Science Organisation (ESSO)- Ministry of Earth Sciences (MoES) jointly invite proposals for research on sustaining water resources for food, energy & ecosystem services in India. This collaboration is supported by the Newton-Bhabha Fund¹, established by the Governments of the UK and India to provide a framework for increasing research and innovation collaborations that support sustainable economic growth, and builds on existing NERC-MoES activities, notably Changing Water Cycle and Drivers of Variability in the South Asian Monsoon.

Proposals are sought for collaborative research projects involving UK and Indian researchers. Up to £3.0m is available from NERC for this call. MoES will match the resources in terms of research effort.

The closing date for Notification of Intent to Submit is **16:00 BST (15:00 UTC) 07 September 2015** and the closing date for Full Proposals is **08 October 2015**

2. Background

Rapid development (demographic and economic change) is increasing stress on India's water resources (rivers, lakes and groundwater) resulting in declining water quantity and quality. These demands on India's water resources are predicted to continue to grow and to be exacerbated by climate change, land-use change, population growth and urbanisation. Ensuring water security is therefore a priority for India, however achieving this requires a good understanding of the amount, movement, storage, quality and usage of water in any given basin, and how each of these is likely to change in future. The aim of this joint NERC-MoES activity is to support the novel environmental science needed to understand the wide range of basin processes and interactions that affect water security to enable sustainable basin-wide water management and contribute to economic development and social welfare.

This activity is supported by the Newton-Bhabha Fund, a joint programme established by the governments of the UK and India. The Fund provides a framework for promoting increased research and innovation collaboration, developing long-term, sustainable partnerships and contributing to economic growth. This activity is part of the programme pillar of the Newton-Bhabha Fund, which aims to support scientifically excellent research in areas that make the maximum contribution towards jointly approved grand societal challenges, in this case research that will contribute to securing the provision of food, water, energy, and ecosystem services.

It is expected that this programme will build on the outcomes of relevant UK-India research collaborations, such as the NERC-MoES funded programmes Changing Water Cycle² and Drivers of Variability in the South Asian Monsoon³. The scope of this call reflects the outcomes of a workshop

¹ <https://www.gov.uk/government/publications/newton-fund-building-science-and-innovation-capacity-in-developing-countries/newton-fund-building-science-and-innovation-capacity-in-developing-countries>

² <http://www.nerc.ac.uk/research/funded/programmes/cwc/>

³ <http://www.nerc.ac.uk/research/funded/programmes/monsoon/>

held in Bangalore on 11-12 March 2015 that brought together researchers from the UK and India (a copy of the report is available on the programme webpages). This workshop also developed some longer-term research priorities and NERC and MoES will be discussing how best to address these.

3. Scope of the call

The amount, movement, storage, quality and usage of water in any given basin are influenced by the complex interactions between a myriad different processes operating at different spatial and temporal scales within the basin. To improve our understanding of these processes it is planned to develop a parsimonious whole systems approach to basin modelling and develop a framework for integrated basin-wide models that incorporate each of the processes within the basin at a temporal and spatial resolution that enables informed decision-making about the management of India's water resources. Critically, the models will have a forecasting capability so they can be used to study future trends and the impact of climate change, land-use change, population growth and urbanisation on water resources. The ultimate goal is to develop a robust and reliable information system and decision support/expert tools for users that will enable informed decision-making and support the sustainable development of India's water resources and hence long-term economic growth and social welfare.

Three case studies will be supported, one in each of the three main geographic regions of India: the Himalayas, the Indo-Gangetic Plain and Peninsular India.

Each case study is expected to develop a framework for a whole systems approach through a range of observations, field studies, laboratory analyses and model development. It is expected that the integrated models will encompass key hydrological processes and how they interact in order to model, understand and predict the hydrological cycle of India using a 'whole-system' approach and advance understanding of how fluxes and storage within heterogeneous basins affect water availability and water quality. Specific issues that may be addressed include:

- How water storage is distributed seasonally and spatially in a basin
- The influence of urbanisation of the hydrological cycle
- How hydro-meteorological fluxes differ for different land-use types and climatic regimes
- The dynamics of deep aquifers
- The impact of episodic events, such as floods and droughts, on basin dynamics
- Constraining uncertainties in hydrological and meteorological observations and models for improved inferences
- How each of these processes and interactions vary over time in response to drivers of change, such as climate change and population growth

To enable a robust and credible framework for a whole systems approach to be developed it is expected that project teams will work together to integrate the research in the three basins where appropriate, e.g. so that common approaches are adopted where possible, best practice can be shared, and engagement with stakeholders can be coordinated. The mechanisms for integrating the three case studies will be discussed and agreed with the successful teams at the start of the projects.

It is recognised that socio-economic issues also have a major role to play in the sustainable management of water resources, and while neither NERC nor MoES is able to fund socio-economic research the funders will seek to ensure that strong links are made with relevant socio-economic research activities.



4. Programme Delivery

NERC are managing the bid submission process on behalf of the NERC-MoES partnership.

Applications to the Sustaining Water Resources for Food, Energy and Ecosystem Services programme must include UK-Indian partnerships – i.e. include at least one India-based researcher and one UK-based researcher.

Up to £3.0m (80% FEC) is available from NERC for this call to fund eligible costs requested by successful grant applications by UK-India teams. MoES are offering an equivalent amount of funding for this programme recognising the difference cost of undertaking science in India and the way that it is accounted for. Successful grants will be funded for up to 3 years and must start no later than 1st April 2016.

The funds available through this call are intended to support focused, coordinated and collaborative research between the UK and India that address the scope of the call as outlined above. These grants should promote inter-institutional collaborations, both between and within the UK and India, and are also expected to enhance opportunities for interdisciplinary collaboration. Proposals must demonstrate that research activities will either achieve more than the partners would have achieved if tackling an issue by working alone, or achieve outcomes at less cost or faster than if working alone. Partnerships should be genuine and reciprocal, and working together must add value to that which could be achieved by individual partners working on their own.

For each grant application a lead Principal Investigator should be nominated from both the UK and India, and they will act as focal points for contact with the funding agency in their respective countries.

4.1 Eligibility

For UK researchers normal NERC eligibility requirements apply, see the NERC [Research Grants Handbook](#) for details.

Indian researchers from the Government institutes including Indian Institutes of Technology, Indian Institutes of Science, Government laboratories, Universities, and Academic institutions are eligible to apply.

Studentships will not be funded as part of this call.

4.2 Structure of the call

This collaboration will support 3 case studies, and applicants are invited to submit a proposal for an interdisciplinary research project focused on the main hydrological processes and how they interact within one of the 3 case study regions: the Himalayas, the Indo-Gangetic Plain, or Peninsular India.

Applicants may choose to work in any basin within one of these regions, but are expected to fully justify their choice of study area, including demonstrating how the selected basin will enable them to address the objectives of the programme and, if applicable, how the work will build on and leverage current research activities and existing infrastructure. Applicants will be responsible for getting the required data for the identified catchment/basin.

Given that the ultimate aim of this programme is to support informed decision-making by users in both the public and private sectors applicants are expected to clearly articulate how their proposed research will address user requirements and how they will ensure users are actively engaged in the projects. Applicants should address these points in both the Case for Support and the Pathways to Impact.

Up to £1m (80% FEC) is available for the UK contribution to each of the case studies, which will be matched by MoES in terms of research effort.

Once funded the project teams are expected to work together to develop the whole systems approach and should therefore **ensure that sufficient time and budget is including in the work plan to enable this cross-project working.**

4.3 Notification of Intent to Submit

A Notification of Intent to Submit a proposal must be sent to sustainablewater@nerc.ac.uk, by 16:00 BST (15:00 UTC) 07 September 2015.

The notification must be on the template provided and include details the topic and location of the proposed research and the institutions, investigators and project partners that are expected to be involved. NERC and MoES will use this information solely to plan the proposal assessment and the notifications will not be assessed or sifted, however **it should be noted that submission of the notification of intent to submit is a requirement of this call and full bids will only be accepted from those teams who submit a completed notification of intent to submit form prior to the deadline.**

The form is available at <http://www.nerc.ac.uk/research/funded/programmes/water-resources/news/ao/noi-form/>

NERC will acknowledge receipt of all notifications and confirm eligibility to submit a full proposal.

4.4 Full applications

Each project should submit a single combined proposal that sets out the research to be carried out by both the UK and Indian partners.

Applications must be submitted using the Research Councils' Joint Electronic Submission system (JeS)⁴. The call will open in JeS on 27 July 2015. Applicants should select Proposal Type- 'Standard Proposal' and then select the scheme – 'Directed International' and the Call – 'Newton Sustaining Water Resources (SWR) OCT15'. **Applicants must ensure that their application is received by NERC by 16:00 BST (15:00 UTC) on the closing date, 08 October 2015.** Applicants should leave enough time for their application to pass through their organisation's Je-S submission route before this date. Any application that is received after the closing date, is incomplete, or does not meet the NERC or MoES eligibility criteria, will be returned to the applicant and will not be considered.

All attachments submitted through the Je-S system, including the Case for Support, must be completed in single-spaced typescript of minimum font size 11 point, Arial font; with margins of at least 2cm. References should also be at least 11 point font. Applicants referring to websites should note that referees may choose not to use them.

Please note that on submission to council ALL non PDF documents are converted to PDF, the use of non-standard fonts may result in errors or font conversion, which could affect the overall length of the document.

⁴ <http://www.nerc.ac.uk/funding/application/howtoapply/>



Additionally where non-standard fonts are present, and even if the converted PDF document may look unaffected in the Je-S System, when it is imported into the Research Councils Grants System some information may be removed. We therefore recommend that where a document contains any non-standard fonts (scientific notation, diagrams etc), the document should be converted to PDF prior to attaching it to the proposal.

The UK costs should be submitted in to the Je-S system. Indian costs should be submitted on the pro-forma provided.

Each lead proposal in the application should have the following documents attached:

1. Case for Support, which is comprised of multiple parts:

Part 1 – A common Previous Track Record incorporating ALL Research Organisations involved (3 sides A4). The Track Record should provide a summary of the results and conclusions of recent work in the technological/scientific area that is covered by the research proposal; Include reference to RCUK, MoES and other relevant funded work. Details of any relevant past collaborative work with other beneficiaries should also be given; Indicate where your previous work has contributed to the UK or India's competitiveness or to improving the quality of life; Outline the specific expertise available for the research at the host organisation and that of any associated organisations and beneficiaries.

Part 2 – A common Description of the Proposed Research. (up to 16 sides A4 including all necessary tables, figures and references) and should include the underlying rationale, describe why the work is strategically important, how the application addresses the scope of this particular call, the key research objectives and hypotheses, and how these will be achieved.

Part 3 – A common Management Plan (up to 1 side A4). To include management structures and plans, participant responsibilities and scheduling chart. Note the management plan should factor in the need to allocate resources to cross-project coordination and integration.

3. Outline Data Management Plan (1 side A4). A common Outline Data Management Plan. This section includes information about how the project will manage data produced and identify data sets of long term value that should be made available to the relevant data centre for archiving and reuse at the end of the grant. Further guidance NERC's Data Policy is available at <http://www.nerc.ac.uk/research/sites/data/documents/odmp-guidance.pdf>

2. Indian costs, justification of these resources and details of the Indian Investigators should be submitted on the separate form provided and entered into Je-S as attachment type 'Non-UK Component'. Indian costs including emoluments for Indian Researchers viz. Research Fellow, Research Associate, Research Scientist will be as per the norms of MoES. The form is available at <http://www.nerc.ac.uk/research/funded/programmes/water-resources/news/ao/costs-form/>

3. Justification of Resources; (4 sides A4). This should be for all UK Research Organisations involved, for all Directly Incurred Costs, Investigator effort, use of pool staff resources, any access to shared facilities and equipment and requests for capital costs between £10,000 and the OJEU threshold, being sought. If capital requests from NERC (i. e. individual items over £10k) are included, applicants are advised to explain the dependence of the project on this capital as well as any contingency plans that would be invoked should it not be possible to fund the capital elements of the proposal. For

further information of what to include in the Justification of Resources, see section E in the NERC Research Grants Handbook.

4. Pathways to Impact; (2 sides A4), detailing:

- those who may benefit or make use of the research;
- how they might benefit and/or make use of the research;
- methods for disseminating data/knowledge/skills in the most effective and appropriate manner.

Full details of the requirements for Pathways to Impact, and a suggested template, can be found on the NERC website⁵. The costs of knowledge exchange activities in the plan should be fully integrated into the proposal costings and justified in the Justification of Resources section.

5. Letters of Support from named Project Partners to confirm that support and facilities will be made available for associated collaborations and co-funding (up to 2 sides A4 each).

Each **component** application (including the lead) will additionally require the following attachments:

1. A CV of up to 2 sides of A4 for each named PI, Co-I, research staff post and Visiting Researcher.

2. Where applicable, a **business case** for items of equipment above the OJEU threshold should be included (up to 2 sides A4).

3. Price quotations for equipment costing more than £25k.

4. Technical Assessment of the request for access to a NERC Facility. PIs wishing to use a NERC facility will need to submit a mandatory 'technical assessment' with their proposal (including aircraft but excluding ships and HPC). For NERC, this means a quote for the work which the facility will provide. A full list of the Facilities requiring this quote can be found here <http://www.nerc.ac.uk/research/sites/facilities/apply/facilities-requiring-technical-assessment.pdf>

4.5 Assessment

The Full Proposals will be internationally peer-reviewed and final funding recommendations made by a moderating panel, consisting of members of the UK and Indian science communities and other independent experts. Applicants will be given the opportunity to provide a written response to peer review comments, which will be made available to the panel along with the reviewer comments. The final funding decision will be made by NERC and MoES based on the recommendations of the moderating panel.

The assessment criteria to be used for the full proposal will be as follows:

- Research Excellence
- Fit to Requirements

Feedback will be provided on unsuccessful proposals.



4.6 Timeline

Intent to Submit deadline: 07 September 2015

Full bid deadline: 08 October 2015

Applicants respond to comments from reviewers: 11-18 January 2016

Decision to be communicated: February 2016

Grants commence: 01 April 2016

5. Contacts

This call is being administered by NERC in the UK on behalf of both the funders. Initial enquiries should be made to:

NERC:

Dr Andy Lloyd, NERC Science Programme Officer

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Email: sustainablewater@nerc.ac.uk

ESSO-MoES:

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