विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY
सत्यमेव जयते

Netherlands Organisation
for Scientific Research

Cooperation India - the Netherlands

Urban Water Systems

Towards sustainable and integrated urban water management systems in fast-growing secondary cities

Call for Expressions of Interest

A Collaborative endeavor of
WATER TECHNOLOGY INITIATIVE
Affordable Technological Solutions
For Water Challenges

New Delhi, July 2018

Contents

1 Introduction

The Department of Science and Technology (DST) of the Government of India and the Netherlands Organisation for Scientific Research (NWO) aim to stimulate long term research collaboration between their two countries by funding joint research in specific domains. Therefore, they are jointly opening a call for an integrated research programme on the topic of urban water management systems. The call will provide funding for highly collaborative interdisciplinary partnerships between Dutch and Indian research groups, within one coherent research programme with a focused theme and consisting of multiple complementary projects. The call is based on a Sandpit procedure for joint design of a research programme with contributing and complementary projects by Indian and Dutch researchers and stakeholders.

This document sets out information about the research programme that is aimed for, and the call procedure including the Sandpit and its application- and assessment procedure.

1.1 Interdisciplinary research programme through joint design

This call addresses the complex challenges to urban water systems faced by fast-growing cities resulting from population growth, rapid urbanisation and the effects of climate change. These processes place an immense strain on cities' water related infrastructures and services, including the wider sourcing areas. There is a need for an integrated systems approach in developing interrelated technological, institutional and financial solutions for sustainable urban water management. Therefore this call will fund one coherent research programme on this theme, consisting of multiple complementary projects covering a wide range of disciplines (e.g. sanitary engineering, urban planning & governance, hydrology, ecology, informatics, economics etc.) providing the synergy required for research on integrated urban water systems. The research should be focused on fast-growing cities in India but results should also be applicable to fast-growing cities in other countries.

A strong Indian-Dutch knowledge base exists concerning different water challenges, such as supply of clean water, waste water treatment, storm water and flood risk management. This call builds on the vast range of experience and the complementary strengths of Indian-Dutch research. At the same time, research communities from both countries are challenged to explore solutions with a view to their adoption in policy and practice in innovative ways, by combining various disciplines and a willingness to work in new partnerships. A Sandpit procedure (see Box 1 and further explained in Chapter 3) will be used to facilitate the process of outlining new research directions and designing an interdisciplinary research programme jointly by Dutch and Indian researchers and stakeholders. The chosen format stimulates the opportunity to incorporate innovative ideas and new actors ("unusual suspects") and partnerships.

Box 1: What is a Sandpit?

A Sandpit is an intensive and interactive workshop, where a diverse group of participants from a range of disciplines and backgrounds, a team of experts and independent stakeholders, get together for multiple days, to immerse themselves in collaborative thinking processes. Sandpits include a highly multidisciplinary mix of active researchers, stakeholders and potential users of research outcomes, to drive lateral thinking and new approaches to address research challenges on a specific topic. Sandpits provide innovative ways of generating research programmes and projects coupled with real-time peer review.

1.2 Available budget and funding conditions

The call budget covers funding for one integrated research programme, consisting of multiple contributing projects, jointly funded by NWO and DST. The Dutch part of the programme grant is subject to a maximum of €1.47 million Euro. This contribution will be matched by DST for the Indian part of the research grant. The research programme consists of multiple research projects and has a maximum duration of 5 years. The research programme allows for the application of a minimum of four PhD/postdoc positions in the Netherlands (duration and fellowship amount as per terms and conditions of NWO). The number of research personnel in India can be 8-10 (duration and fellowship amount as per terms and conditions of DST).

For the Dutch applicants, NWO's general terms and conditions are applicable to this programme.

For the Indian applicants, applicable terms and conditions are as per DST's guidelines available on www.dst.gov.in.

2 Aim of the programme

2.1 Thematic focus

Population growth and rapid urbanisation, coupled with the effects of climate change pose severe stress on urban water systems in Indian cities just as in fast-growing cities in various other countries. Fast-growing cities face many challenges in their water service provision (such as sourcing, distribution, allocation, recycling, drainage and safe disposal of water) as well as the development of climate resilient water infrastructures. These challenges apply to the megacities in India, but even more so to the fast-growing secondary cities (or regional urban hubs). The small to medium size cities are currently dealing with higher population growth rates than megacities, with usually less extensive staff and technical expertise to support them. Better knowledge on cost-effective technological solutions, and knowledge and capacity concerning effective governance and planning issues are required to tackle these cities' challenges.

The Government of India has mounted an ambitious mission to develop a hundred smart cities across the country to address urbanization challenges and seize new opportunities. The objective of this Smart Cities Mission (smartcities.gov.in) is to promote cities that provide core infrastructure and give a decent quality of life to their citizens, a clean and sustainable environment and apply 'smart' solutions, with a focus on sustainable and inclusive development. Sustainable urban water management is of key importance in this smart city development, as the hydrological cycle plays a key role in an urban system and its relations with the wider region. The conceptualisation of smart urban development varies from city to city, depending on the level of development, availability of resources, aspirations and willingness to change. A 'smart city vision' on urban water management has to take into account the complex interactions between different water-related processes and the local socio-economic conditions. The actual implementation of smart city concepts requires knowledge and capacity development at various levels.

Management of the different urban water processes (such as fresh water sourcing, exploitation and distribution, waste water treatment, storm water and flood risk management, safeguarding water quality & water quality monitoring) needs to be integrated. The organisation of various water-related departments requires more synergy and attention for local-regional-national and cross-sectoral linkages, directed towards more collaboration for greater effectiveness in utilising the scarce water resources. In order to develop and implement integrated urban water management systems, the understanding of how the different processes – which tend to be governed separately – interact within the local/regional urban hydrological cycle is crucial. It requires a broad view on urban water systems and their interactions with external processes in an integrated systems approach. Opportunities may arise from identifying inter-linkages between the water system and other key processes for sustainable urban development, such as energy, minerals, nutrient and waste cycles; their intricate nexus with water may be worth exploring.

Research for integrated and sustainable urban water management systems requires collaboration between different disciplines and co-creation with relevant stakeholders. It requires combining different types of local practice-based and scientific knowledge, as well as providing clear transformation pathways for innovation and application in policy and practice. Through more integrated and participatory urban governance and planning, innovative social and technological solutions can be developed and implemented more effectively. Active engagement of local stakeholders is crucial for the appropriateness of urban water technologies in the local context.

While there are numerous challenges for urban water system management, they also present a plethora of opportunities for cost-effective solutions based on innovative technology and governance concepts. Where the Netherlands has developed a vast range of technology solutions and best practices in water management, the Indian Innovation System is ideally placed to add value through effective cost optimisation of these solutions and making them available for wider application across the world in cities experiencing similar challenges and opportunities. There are several successful examples in both countries where innovative practices have enabled management of the complex issues involved. This call builds on these past experiences and complementary strengths of Indian-Dutch research. At the same time, this call challenges the field to explore innovative solutions and their application in policy and practices, by combining disciplines and working in new forms of research partnerships. The role of different stakeholders in the public and private sector in accelerating deployment of these innovations is recognised in this approach.

2.2 Objectives

This call is aimed to design one joint Indian-Dutch research programme to develop integrated and sustainable urban water management systems and implement effective solutions as outlined in the thematic focus above. The objective concerns the following question:

How can technological dimensions and social, management and governance issues of complex urban water systems be integrated, strengthened and made more sustainable, in order to tackle the combined challenges of rapid urbanisation and the effects of climate change in fast- growing secondary cities?

The call is based on a Sandpit procedure and should result in a research programme that meets the following criteria:

1. Holistic and interdisciplinary approach
   - The research programme should be characterised by a holistic approach with an integrated perspective on the urban water system, including technology, urban planning and governance.
   - The contributing research projects should form one coherent programme and together address the overall programme objectives. The interdependence between the individual research projects and synergy should be clear.
   - The research programme and its contributing projects should have a strong interdisciplinary character.

2. Relevance for fast-growing secondary cities
   - The research programme should focus on fast-growing secondary cities (or regional urban hubs), with case location(s) in India. Results and insights may also be applicable in other countries.
   - The research programme should provide scalable results, for example, by pursuing a comparative perspective with multiple cases or varied research locations.
   - The research should provide innovative effective solutions that are sustainable, socially desirable and implementable.

3. Impact-focused research based on co-creation
   - The research programme should incorporate co-creation (see Box 2) in all stages of research development and implementation.
   - The programme should include strategies to maximise the societal impact of the research.

- Relevant public and private sector stakeholders (see Box 2) should be engaged in the research projects.

4. Optimal use of Indian-Dutch research strengths
   - The research should build on the vast range of experiences and complementary strengths of Indian-Dutch research.
   - The programme offers opportunities for novel Indian-Dutch research partnerships.

Box 2: What is meant by co-creation and stakeholders?

Co-creation is a form of cooperation in research where different parties (researchers and stakeholders) interact and engage in joint learning in a knowledge demand and supply process. Such interaction and joint learning takes place in the different stages of this process: the problem definition, formulation of possible solutions, design of the research, conducting the research, the assessment of the results, and the translation of these into new practices and products. The diversity of perspectives and of the type and level of knowledge is seen as an asset that can support a constructive way of mutual learning and design.

Stakeholders are defined as natural or legal persons (at local, national or international level) who have an interest in the results of the research. This definition includes internal stakeholders (consortium partners) and external stakeholders (non-project partners), as well as primary stakeholders (those who are intended to benefit or may be affected by the intervention, also end users or target groups) and secondary stakeholders (those with an intermediary role).

3 Call procedure

The call procedure is based on a Sandpit procedure and consists out of three phases:

	What	How	When
Phase 1	Sandpit participant selection	Based on Expressions of Interest (EoI); assessment by Advisory Committee	Deadline submission EoI: 10 September 2018, 14:00 CET (17:30 IST)
Phase 2	Sandpit workshop	Multiday workshop in India to design an Indian-Dutch research programme and contributing projects	27-30 November 2018
Phase 3	Full programme proposal	Elaboration of research programme outline that is produced during the Sandpit; assessment by Advisory Committee	Deadline submission full proposal: 31 January 2019, 14:00 CET (18:30 IST)

A detailed timeline of the procedure is provided in chapter 4.

3.1 Sandpit: joint research programme development

The call procedure is aimed to develop a research programme by means of a creative and collaborative model: a Sandpit. This is a multiday interactive brainstorm workshop in India (27-30 November 2018), in which a selected group of Indian and Dutch researchers and stakeholders, who are willing and able to actively engage in the programme, will be mobilised to jointly design the research programme. The selection of Sandpit participants by the Advisory Committee will be based on Expressions of Interest.

It should be noted that participation in the Sandpit is no guarantee for funding. The process of developing research proposal outlines and consortia in the Sandpit is a dynamic process and includes assessments of ideas by peers and independent experts at different stages during the event. Research proposal outline(s) need to be elaborated after the Sandpit and will be assessed by the Advisory Committee.

3.1.1 How will the Sandpit work

A Sandpit is an intensive, interactive workshop designed to produce highly innovative research proposals. Participants from a diverse range of disciplines come together in a creative free-thinking environment – away from their everyday routines and responsibilities – and immerse themselves deeply in a collaborative process around an important challenge, in this case: how to develop sustainable and integrated urban water management systems in fast-growing secondary cities (and the objectives as stated in section 2.2).

The goal of the Sandpit is to design an innovative and coherent research programme including an overall framework and multiple, interdisciplinary projects, to be developed into a full joint Indian-Dutch research proposal after the Sandpit. The key objective of the Sandpit is to bring together Indian and Dutch researchers with diverse scientific backgrounds and practitioners with various perspectives in order to engender innovative thinking and new approaches for research on integrated urban water systems. Through interaction with the invited stakeholders a clearer understanding of the problem at stake can be made and knowledge and research gaps can be identified. The Sandpit is a unique opportunity to share ideas and develop future collaborations, also outside the scope and funding of this call.

In preparation of the Sandpit, further scoping activities will be done in order to have a clear starting point for the collaborative process of research design. In collaboration with the Advisory Committee, an inventory will be done on the current academic debates that are relevant for the thematic focus as described in this call document, and suggestions for key research questions are collected by the Expressions of Interest (EoI) from the potential participants.

More information about the Sandpit, including a detailed programme and description of the different roles during the Sandpit (of selected participants, facilitators, external experts and NWO/DST staff) and relevant background information will be provided to participants when selected.

3.1.2 Who can apply

Expressions of Interest are invited from individual researchers who can contribute to the Sandpit and the resulting research programme. Up to fifteen Dutch and fifteen Indian participants will be identified to take part in the Sandpit workshop. The Sandpit is accessible for selected and invited participants only. Travel and accommodation costs of the invited participants will be reimbursed.

Eligible applicants are from India or the Netherlands and should hold a regular research position in:

- a research organisation[1] that is based in The Netherlands, or
- a recognised academic institution or public funded research & development organization that is based in India.

Having the right mix of participants, with contributions by researchers with a variety of backgrounds and expertise, is crucial for a successful Sandpit and for the resulting research programme. Expertise is required from a broad range of disciplines, which could include sanitary engineering, urban planning & governance, hydrology, ecology, informatics, economics, etc. However, the disciplines that should be represented at the Sandpit are not defined beforehand, but potential participants are asked to indicate how their expertise can address the challenge of working towards integrated and sustainable urban water management systems in India. Applications are encouraged from individuals representing diverse research areas across a range of disciplines that are relevant to the programme theme. Applicants should not feel limited by conventional perceptions: the Sandpit approach is about bringing people together who would not normally interact.

[1] *Research organisations* include any organisation: (cumulative conditions)

- of which one of its main tasks is to carry out independent research;
- that has no profit motive other than that for the purpose of further research;
- whose researchers enjoy freedom of publication in the international (academic) literature.

3.1.3 How to apply: Submission of Expression of Interest

Applicants should complete an Expression of Interest (EoI) form for Sandpit participation which can be downloaded on the NWO website (www.nwo.nl/india-urban-water). Completed EoI forms should be submitted by e-mail to india-urbanwater@nwo.nl with copy to neelima.alam@nic.in. The deadline for applications is **10 September 2018 at 14:00 hours CET (17:30 IST)**. Please note: Expressions of Interest received after the deadline for applications will not be considered. Applicants will be notified early October 2018 of the outcome of their application to attend the Sandpit.

The EoI form asks for the applicant's personal details and a description of his/her potential contribution in the development and the implementation of a joint Indian-Dutch research programme that fits the scope and conditions of this call. The form includes information about the applicant's professional background and relevant expertise, but should also include a convincing description of the applicant's motivation to participate in this interactive process of joint research programme development in a Sandpit and his/her competencies required for interdisciplinary research.

Applicants should ensure they complete all sections of the EoI form, as this is the only information on which potential Sandpit attendees will be selected. It is therefore important that evidence is given of the expertise and skills that the applicant will bring in the application.

In order to participate, applicants must be available from 27-30 November 2018 for the Sandpit in India (this does not include travel time). Dutch applicants must also be able to obtain a visa (an invitation letter will be provided) and travel to India. These and other requirements are to be confirmed in the EoI form.

Applicants are invited to provide input that may be used in the preparation and scoping of the Sandpit. The EoI form asks for the applicant's ideas about key questions or critical issues in the development of an interdisciplinary research programme within the scope of this call, and suggestions for key stakeholders (representatives of private and public organisations) to invite. NWO and DST may invite stakeholders who are suggested in the selected Expressions of Interest to join the Sandpit, based on the advice of the Advisory Committee.

3.1.4 Assessment criteria for Expressions of Interest

Expressions of Interest to attend the sandpit will be considered by the Advisory Committee. Applicants will not only be assessed on their professional background and expertise, but also on their personal skills that are needed in this interactive process of joint research development and competencies in terms of co-creation and interdisciplinary research.

Overall, the selection will be based on the specific criteria outlined below:

Academic / professional attributes

- Strength of expertise relevant to the thematic focus as defined in this call document;
- The ability to develop innovative and high quality research ideas from a systems perspective;
- The potential to contribute to research between disciplines.

Personal attributes

- The ability to work in a team across disciplines and nations;
- The motivation and ability to work in a Sandpit (e.g. openness to new ideas, ways of thinking and working; creative; curious; collaborative; etc).

The Advisory Committee will seek for a balance of complementary expertise to be present at the sandpit. Participants will be chosen to allow equal representation in the different fields of expertise from the Netherlands and India.

3.2 Full proposals

A full proposal for a joint Indian-Dutch research programme, including the sub-project descriptions, can only be submitted by applicants who were selected for and participated in the Sandpit. Participants involved in the projects that are developed during the Sandpit will be tasked to write the full proposal covering their intended activities as identified at the Sandpit, taking into account the final advice of the Advisory Committee at the end of the Sandpit. As stated in section 3.1, the process of developing research proposal outlines and consortia in the Sandpit is a dynamic process and may lead to competing research programme proposals.

The compulsory format for proposals and accompanying guidelines will be provided to the selected Sandpit candidates prior to the Sandpit workshop.

The deadline for the submission of full proposals will be 31 January 2019. Applicants to the Sandpit should therefore reserve the time needed to work on full proposal(s) in the period of December 2018 – January 2019 after the Sandpit workshop.

The full proposal(s) will be assessed by the Advisory Committee. Assessment criteria as described in section 2.2 will apply. NWO and DST will make the final funding decision based on the advice of the Advisory Committee. The board of NWO and the Indian board responsible for the DST grant take a 'conditional decision' on the advice of the Advisory Committee. After both boards have reached the same 'conditional decision' the joint decision becomes effective.

3.3 Advisory Committee

The Advisory Committee advises DST and NWO on the selection of Sandpit participants and on the final granting of the full proposal(s) after the Sandpit. During the Sandpit workshop, the Committee will act as an advisory body in the joint development of research ideas and outline of the programme and contributing projects. Finally, the Committee members may take part in monitoring, progress or networking activities involving the funded research programme, as appropriate, and time allowing.

The Advisory Committee consists of six members, equally appointed by DST and NWO. The Committee members are knowledgeable and experienced in interdisciplinary research and systems thinking in the broad field of urban water management. The committee may be temporarily expanded for the Sandpit workshop, with specific expertise that is lacking in the original Committee composition but crucial for adequate advice during the joint research development in the Sandpit.

The composition of the Advisory Committee will be made available on the NWO website (www.nwo.nl/india-urban-water) and DST website (www.dst.gov.in).

The NWO Code of Conduct on Conflicts of Interest and DST code of conduct on conflict of interest applies to all persons and NWO staff involved in the assessment and/or decision-making process.

4 Timeframe

Deadline for the Expressions of Interest for Sandpit participation is Monday 10 September, 14:00 CET (17:30 IST).

Sandpit procedure	
Activity	**Date / period**
Publication Call Expression of Interest for Sandpit participation	17 July 2018
Deadline Expression of Interest for Sandpit participation	10 September 2018, 14:00 CET (17:30 IST)
Assessment of Expressions of Interests by Advisory Committee	September 2018
Advisory Committee meeting: Selection of participants and Sandpit preparation	Early October 2018
Invitation of selected Sandpit participants	Early October 2018
Sandpit workshop in India (4 days)	27-30 November 2018
Full proposal and granting	
Development of full research programme and sub-project proposals	December 2018 - January 2019
Deadline submission full proposal(s)	31 January 2019, 14:00 CET (18:30 IST)
Assessment of full proposal(s) by Advisory Committee	February 2019
Final granting decisions by boards NWO and DST, announcement of decision to applicants	Early March 2019
Start of the research programme	April 2019

Whilst NWO and DST aim to meet the target dates provided above, we reserve the right to change these at any stage.

5 Contact details

For specific questions about this call for Expressions of Interest please contact:

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