Call for PhD Positions (Re-advertisement)

Applications are being invited from highly motivated candidates for **2 PhD** positions at the Department of Physical Geography of **Utrecht University (UU)**, the Netherlands, as external PhD students (**degree will be conferred by UU**) and based at the Institute of Water and Flood Management (IWFM) of Bangladesh University of Engineering and Technology (BUET), under the project **Systems Approach for Creating Sustainable Landscape and Resilient Community in Riverine and Coastal Socio-Ecological System**. This project is funded by **the Dutch Research Council (NWO)** under NWA L2 - ADM-LAB Livings Labs for ADM in Bangladesh. NWO is one of the most important science funding bodies in the Netherlands and realizes quality and innovation in science. Under this grant, this project will be implemented by eleven universities from Bangladesh, Netherlands and USA.

Brief description of Project

The Ganges-Brahmaputra-Megna coastal delta is a vibrant hub of socio-economic activity and rich in biodiversity and fertile lands, but due to its high biophysical and social vulnerability it faces immense challenges of cyclonic storm surges, flooding, river channel migration, land subsidence, uncertain sediment delivery, water salinization, and riverbed sedimentation and the resulting waterlogging in tidal floodplains. Climate change and sea-level rise have already started to reinforce these existing stresses. Community resilience is further impacted by high socio-economic vulnerability, in the form of high population density and population growth, poverty, gender inequalities, slow socio-economic development, and limited access to education and employment opportunities. These challenges are compounded by reliance on freshwater and sediment flows, poorly planned interventions, and delta landscape modifications, which render communities highly sensitive to even minor perturbations. Despite interventions implemented in the past three decades, the bio-physical and socio-economic challenges are still plenty, principally arising from unbalanced supply and management of water and sediments within the deltaic system, unreliable water infrastructures, and inadequate harmonization of scales and sectors while implementing interventions.

To fully realize the delta vision, it is important to identify (*what* to do?) and prioritize strategies across multiple scales (*where* to do?) and phase them appropriately (*when* to do?), in alignment of the principle of adaptive delta management (ADM). Key challenges and knowledge gaps in achieving the desired objectives of delta management strategies are:

- Missing social-ecological systems (SES) perspective on interconnectedness of socio-demographic, economic, governance, bio-physical, and climatic-hydrological components, resulting in strategies offering short-term benefits but failing to achieve sustainability in the long term.
- A lack of systems understanding regarding delta-scale water flow and sediment transport, dispersal, and deposition, and their interactions with anthropogenic interventions and climate change, which is critical for planning and interventions in harmony with the natural potential of the river system.
- The GBM delta faces a "paradox of scale"; whereas the delta is considered sustainable at a system scale with high sediment delivery and net gain in land area, many areas within the delta exhibit local dynamics and instability at the scale at which households and communities experience environmental change. Conversely, interventions in one area can adversely affect hydro-morphology and channel dynamics in another.
- A lack of understanding of the context specificity of WSM strategies, i.e., how WSM strategies interact with biophysical and societal factors, as well as their ecological impacts on river systems and local communities. For sustainable delta landscape and resilient community on the longer-term, it is necessary to shift from discipline-specific approaches to multi-disciplinary approaches to capture the full range of environmental parameters and the connectivity of natural and anthropogenic processes, environmental risk, and ecosystem responses at the local and delta-scale.
- A lack of understanding of long-term effectiveness and maintenance requirements of polder embankments. Also, the potential benefits of integrating nature-based solutions with traditional infrastructure need further exploration to assess their effectiveness in reducing storm surge impacts.

Research focus

In this research project, we focus on better understanding how different system components of the SW-GBM delta interact, and how delta management can be harmonized with local water-sediment management strategies, for sustainable landscapes and equitable benefits across different delta communities. We will develop an integrated systems framework with the ability to analyze impacts of different (sets of) WSM interventions and their synergies and trade-offs across multiple scales and sectors. Our central research question is:

> *"How can we identify and prioritize water and sediment management (WSM) interventions that are robust and flexible across multiple scales and sectors, maximizing multi-sectoral synergistic benefits while minimizing trade-offs or maladaptation, supporting the resilience of diverse communities through equitably reducing risk and fostering climate-resilient development?"*

Description of the positions

Position 1: Building delta-scale sediment reference and context for WSM strategies, utilizing the concept of paradox-of-scale: building delta-scale budgets and using process-based modelling to identify effect of large scale (im)balance on small scale (in)stability. The broader water and sediment budgets will constrain necessary boundary conditions for other work, for example to future salinity intrusion. Specific activities will include:

1. Delta-scale: Produce delta-wide sediment and relative-sea level rise budgets from the past (100s to 1000s years) to the future (2050, 2100, 2200, 2300).
2. Process-scale: Use sediment budgets in existing process-based models (e.g. Delft3D or Mike21FM) to investigate effect of delta-scale sediment (im)balance on local processes (sediment/erosion/channel stability).
3. Building a future: add effects of human activities on sediment budgets and consequences for local (in)stability and find potential for WSM strategies across the delta.
4. Define and quantify effect of WSMs on delta-scale adjustment to relative sea-level rise.

Position 2: Multi-scaler interventions and strategic delta planning. Spatial - from regional to coastal to local; temporal - from short-term to medium-term to long-term; creating a framework for identifying and phasing water and sediment management (WSM) strategies. Specific activities include:

1. Identify WSM interventions or measures, focusing on sedimentation enhancing strategies, across spatial scales e.g. delta-scale: water/sediment diversion and redivision between lower Ganges delta channels; local scale: afforestation, bandalling, TRM, wetland restoration (and combining plus upscaling local measures).
2. Using a hydro-morphodynamic model to simulate time-evolution of interventions – establish time until approximate (bio)physical equilibrium of each identified intervention to maximise benefits while minimising regional disruption. Disruption includes TRM operation, but also intervention upkeep and replacement (important for pathways planning, when opportunities for changing interventions are provided).
3. Using a hydro-morphodynamic model to study spatial and feedback effects of interventions (channel-floodplain sediment, hydraulics and morphology), focusing on the effects of individual interventions on local and regional (bio)physical systems.
4. Define and quantify solution space dimensions for identified interventions – take previously identified solution space subdimensions as a baseline, identify which are relevant, and which are quantified or quantifiable.

Requirements

We are looking for enthusiastic, broad-minded and dedicated researchers with a strong interest in water and sediment modeling and management strategies. You must have a relevant academic background and eager to contribute to generating new knowledge and innovation. You must demonstrate a combination of scientific curiosity, a reflective mindset, a strong sense of teamwork and excellent communication skills. You are comfortable working in interdisciplinary and international settings, and you are motivated to work full-time. You value ethical engagement, inclusiveness, and co-creation with local communities.

Specific requirements

- For admission to the PhD programme at Utrecht University, the candidate should have an MSc degree from an internationally recognized University. The candidate should have excellent command of English (spoken and written); TOEFL/IELTS may be required if the candidate's MSc was not taught in English.
- Good grasp on coastal systems, including process understanding of coastal hazards and disasters, vulnerabilities, and risk reduction strategies
- Outstanding analytical skills
- Strong skills in numerical modeling of riverine and coastal processes
- Proficiency in using model packages or Python code, or willingness to learn these.

General qualification criteria:

- Full-time availability from for a period of 4 (four) years.
- Enthusiastic and dedicated researchers, with scientific curiosity and a strong sense of teamwork
- Excellent communication skills
- Ability to work and share knowledge in an interdisciplinary team and a strong ambition to accomplish the research goals of the project
- Good command of English in speaking and writing
- Willingness to spend considerable periods at case sites in the coastal region of Bangladesh for field work
- Publications will be considered an added qualification

Terms and conditions of employment

- The PhD positions (two) are available for a fixed duration of 48 months on a non-extendable full-time basis (40 hours per week).
- They will pay three 3-month visits to Utrecht University during the project. After the first year there will be a formal assessment of the progress of both PhD candidates, resulting in a 'Go' or 'No-Go' decision for further completion of the PhD programme. Upon successful completion of the thesis, both candidates will receive PhD degrees from Utrecht University.

Remuneration:

- The financial conditions will be in line with a PhD appointment in Bangladesh with a Fellowship package allocated in the project when based at BUET for 39 months for both positions.
- During the visits to Utrecht University, PhD students will be provided with a gross monthly allowance of 2,500 Euro, as well as economy-class travel grants (Dhaka-Utrecht-Dhaka) for each visit and assistance in finding temporary accommodation, courtesy of IHS. Insurance, etc., costs are included in the allowance.

Contact and Application

Application for Postdoc and PhD positions needs to be sent to **Professor Md. Munsur Rahman** (E-mail: munsurbuet1989@gmail.com) and **Dr. Shampa** (shampa.iwfm@gmail.com) which should include a CV highlighting academic and research achievements, a Letter of Intent and names of 3 (three) referees. The **email subject line should be "NWO PhD Fellowship Application_YOUR NAME**".

Application deadline: 10th June, 2026

Please note that shortlisted candidates will go through a multi-stage selection process (including on-line interviews) before appearing at the final selection interview which will take place at IWFM, BUET, Dhaka. The date of the interview will be communicated after short-listing.