BOOK *Of* ABSTRACT

RESEARCH SEMINAR ON "BANGLADESH: CLIMATE & DEVELOPMENT"

JUNE 30–JULY 1, 2026
UTRECHT, THE NETHERLANDS

ORGANIZED BY

CULTURES OF ADAPTATION NETWORK (CAN)
UTRECHT UNIVERSITY, THE NETHERLANDS

Utrecht University
WAGENINGEN UNIVERSITY & RESEARCH
THE OHIO STATE UNIVERSITY

International Research Seminar on Bangladesh: Climate & Development

Organized by

Cultures of Adaptation Network (CAN)
Utrecht University, The Netherlands
Wageningen University and Research (WUR), The Netherlands
Ohio State University, USA

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Program Background

Bangladesh has emerged as a notable development success story. Over the past five decades, the country has achieved substantial progress in poverty reduction, economic growth, public health, education, disaster risk reduction, and social development. Simultaneously, Bangladesh remains on the front lines of global climate change, facing recurrent floods, cyclones, salinity intrusion, heat stress, river erosion, and rapid urbanization. These challenges have stimulated innovative adaptation practices and governance mechanisms that are increasingly recognized as globally relevant. As a result, Bangladesh has become an important case for understanding the complex relationship between climate change, sustainable development, human mobility, environmental governance, and societal resilience.

Although there is no official registry of Europeans working in/on Bangladesh, available evidence suggests that the community is substantial and growing. Based on different sources, including Erasmus Plus, German-Bangladesh Higher Education Network, BdREN (Bangladesh Research and Education Network), BRAC Europe, British Council Transnational Education (TNE), Dutch Research Council (NWO), TEIN (Trans-Eurasia Information Network) etc. an estimated 300–600 researchers focus primarily on Bangladesh, across Europe, while an additional 2,000–4,000 academics engage through collaborative projects, publications, and student supervision in fields such as climate change, migration, public health, water governance, disaster risk reduction, and sustainable development.

According to Development Finance Institutions (DFIs), the European Investment Bank, Team Europe Initiatives, etc., on the investment side, around 100–200 major European companies and institutional investors have active engagements in Bangladesh, complemented by an estimated 1,000–3,000 private investors and business leaders involved in sectors including textiles, renewable energy, information technology, infrastructure, agriculture, and pharmaceuticals.

Taken together, Europe likely hosts a network of approximately 3,500–8,000 researchers, investors, and professionals with active interests in Bangladesh, representing a valuable community for strengthening scientific collaboration, innovation, trade, and sustainable development partnerships between Europe and Bangladesh

Thus, Bangladesh's experiences offer valuable lessons not only for countries in South Asia but also for policymakers, researchers, and practitioners worldwide seeking sustainable pathways to climate-resilient and inclusive development. At the same time, Bangladesh's strategic importance in global discussions on climate adaptation, delta management, migration, food security, and sustainable urbanization continues to grow. Despite this importance, research and knowledge exchange on Bangladesh within European knowledge entities remain fragmented across institutions and disciplines. There is currently no dedicated European platform that systematically connects scholars, policymakers, development practitioners, and diaspora communities working on Bangladesh-related issues.

Against this backdrop, Utrecht University proposes to host an International Research Seminar on “Bangladesh: Climate and Development” in collaboration with Wageningen University & Research (WUR), The Ohio State University (OSU), and the Embassy of the People's Republic of Bangladesh in the Kingdom of the Netherlands. The seminar will bring together leading scholars, policymakers, development partners, and civil society representatives to discuss the contemporary challenges and opportunities facing Bangladesh. More importantly, the event will serve as a launching platform for establishing an European Center on Bangladesh Knowledge at Utrecht University, envisioned as a leading European hub for Bangladesh studies, policy engagement, and international collaboration.

Vision

The proposed seminar will act as a starting point for establishing the European Center on Bangladesh Knowledge, which aims to become a premier European platform for interdisciplinary research, education, policy dialogue, and knowledge exchange on Bangladesh. Building on existing collaborations among Dutch, European, North American, and Bangladeshi institutions, the Center will facilitate innovative research and foster long-term partnerships that address global challenges in climate resilience, and sustainable development.
The Center will not only advance academic excellence but also strengthen science-policy interactions by connecting universities with governments, international organizations, development agencies, and private-sector actors.

Objectives

The proposed seminar has both academic and strategic objectives.

- Academically, it aims to create a platform for presenting cutting-edge research on Bangladesh's climate and development challenges, while fostering interdisciplinary dialogue among researchers from Europe, North America, and Bangladesh. The seminar will host talks from 30+ researchers and practitioners on the topics thematically linked to Climate and development in Bangladesh.

- Strategically, the seminar seeks to initiate discussions on establishing the European Center on Bangladesh Knowledge and to build a coalition of institutional partners committed to supporting its development. The event will explore opportunities for joint research projects, educational exchanges, collaborative funding applications, and policy engagement activities.

About the European Center on Bangladesh Knowledge

The establishment of an “European Centre on Bangladesh Knowledge” at Utrecht University, through the international “Cultures of Adaptation Network (CAN)” under Utrecht University's “Pathways to Sustainability” strategic theme, represents a unique opportunity to create a long term institutional platform dedicated to Bangladesh studies in Europe. The Center will facilitate interdisciplinary research and teaching activities while serving as a bridge between academic knowledge and policy practice. It will support collaborative projects involving universities in Bangladesh, Europe, and North America, while also providing opportunities for student exchanges, visiting scholars, joint supervision of doctoral candidates, professional training programs, and public-private research and economic development initiatives. Through the Center, the founding team will pursue a forward research agenda (e.g., delta risk; climate (im)mobility analytics; health and environment under climate stress).

The Center will also serve as a focal point for dialogue among researchers, policymakers, development organizations, and diaspora communities. Through conferences, workshops, policy forums, and public engagement activities, it will contribute to evidence-based policymaking and strengthen international cooperation on climate adaptation, development planning, and societal resilience.

Over time, the Knowledge Center can evolve into the leading European hub for Bangladesh studies, comparable to existing regional knowledge centers focused on other strategically important regions worldwide. Its activities will extend beyond academia to support cultural diplomacy, development cooperation, and international partnerships between Bangladesh and Europe.

Program Schedule

Day 1, June 30, 2026		
Time	**Event/Program**	**Moderated/Presented by**
09:00- 9:30	**Registration**	**Registration desk** Belle van Zuylenzaal, Academy Building, Utrecht University
9:30 - 10:50	**Opening Ceremony** Belle van Zuylenzaal, Academy Building, Utrecht University Belle van Zuylenzaal - Utrecht University Hall - Utrecht University Microsoft Teams meeting Join: https://teams.microsoft.com/meet/329636234019183?p=DXwBdpZYmHN2PhhadH Meeting ID: 329 636 234 019 183 Passcode: Pt2nf6Dn	
9:30 - 9:40	Welcoming the seminar	*Bishawjit Mallick* (UU) *Kelsea Best* (Ohio State University, USA)
9:40 - 10:00	Short presentation of four ADM-LAB living labs projects	*Syed Mustafa*, Wageningen University and Research (WUR), *Frances Dun* (UU), *Samuel Jonson Sutanto* (WUR), *Bishawjit Mallick* (UU)
10:00 - 10:10	Opening remarks by the Faculty of Geosciences, UU	*Prof. Dr. A. Wezel*, Dean, Faculty of Geosciences, UU
10:10 - 10:20	Opening remarks by the Bangladesh Embassy in the Netherlands	*H.E. Faiyaz Murshid Kazi*, Honorable Ambassador of Bangladesh
10:20 - 10:30	Special remark by Khulna University, Bangladesh	*Prof. Dr. Rezaul Karim*, Vice Chancellor of Khulna University,
10:30 - 10:40	Special remark by NWO	*Lilianne Sweere*, NWO ADM LAB program
10:40 - 10:50	Closing the ceremony by the Department of SGPL, UU	*Prof. Dr. E. Buitelaar*, Head of the Department of SGPL, UU
10:50 - 11:20	**Coffee break and socializing**	
11:20 - 12:00	**Travel to Uithof**	**Shuttle bus** From Janskerkhof, in front of Streetfood Club TSFC Utrecht - The Streetfood Club

12:00 - 13:00	**Lunch** **Victor J. Koningsberger building, Room 228.** Budapestlaan 4a-b, 3584 CD Utrecht, The Netherlands Victor J. Koningsberger building - Campus -Utrecht University	
13:00 - 14:30	**Session 1: Water, Salinity, and Environmental Health** *Victor J. Koningsberger Building, Room 208.*	**Chair:** *Hans Middelkoop,* Utrecht University **Co- Chair:** *Syed Mustafa,* Wageningen University & Research
13:00 - 13:15	1.1 Access to water and the real salinity story: reflections from coastal Bangladesh	*Brooke Ackerly*, Political Science, Vanderbilt University, USA; *Mujibul Anam*, Public Health at School of Medicine and Dentistry, Griffith University, Australia
13:15 - 13:30	1.2 Scenario-based drinking water demand forecasting under climate change uncertainties: a study on Dhaka City, Bangladesh	*Md Faysal Tareq, Adriaan Mels, Romano Radjkoemar, Katarzyna Kujawa-Roeleveld, Kamonashish Haldar,* Institute of Environmental Sciences (CML), Leiden University, The Netherlands
13:30 - 13:45	1.3 A pattern language for water management in Bangladesh	*Willem van Deursen*, Carthago Consultancy
13:45 - 14:00	1.4 Rising temperature - rising vulnerabilities	*Zakia Sultana,* Utrecht University, The Netherlands
14:00 - 14:15	**Session discussion and reflection**	
14:15 - 14:45	**Coffee break**	**Koningsberger building, Room 228**

14:45 - 15:45	**Online session 1** Microsoft Teams meeting Join: https://teams.microsoft.com/meet/331361801664507?p=dJvzyedARLjdtjB54m Meeting ID: 331 361 801 664 507 Passcode: 2o8hZ9a6	**Chair:** *Kamonashish Halder*, Wageningen University & Research **Co-chair:** *Zakia Sultana*, Utrecht University
14:45 - 15:00	01. Climate change and changing sources of safe drinking water: The poetics and politics of development in Sundarbans	*Md Rahamatullah*, Department of Sociology, South Asian University, New Dellhi-110068
15:00 - 15:15	02. Financing climate-resilient infrastructure under multi-hazard risk: a ppp based framework for bangladesh	*Md. Mainul Islam*, Public Works Department, Bangladesh; *Tawhid Amanullah*, Architect & Environment Analyst, DotlineVisions, Sweden
15:15 - 15:30	03. Modeling the influence of blue-green-gray (b2g) infrastructure on urban temperature using machine learning in khulna city	*Md Refath Hossan* & *Mohammad Ismail Hossain*. (Institute of Disaster Management, Khulna University of Engineering & Technology, Bangladesh.)
15:30 - 15:45	04. When projects end, what remains? Rethinking adaptation in coastal bangladesh	*Rawnak Jahan Khan Ranon*, *Samiha Saleha*, *Savio Rousseau Rozario*, International Center for Climate Change and Development
15:45 - 16:00	**Coffee break**	**Koningsberger building, Room 228**

16:00- 17:30	**Session 2: Migration/Non-Migration & Development** *Victor J. Koningsberger building, Room 208*	***Chair:*** *Ajay Bailey, Utrecht University* ***Co-chair:*** *Kelsea Best, Ohio State University*
16:00 -16:15	2.1 How Loss and Damage Cascades: Protracted displacement in Bangladesh	*Steven Miron*, Refugee Law Initiative, School of Advanced Studies, University of London

	and what can be done about it	
16:15 - 16:30	2.2 Life satisfaction and (non-) migration aspiration under environmental stress in Southwest Bangladesh	*Tolina Addisu*, Utrecht University
16:30 - 16:45	2.3 Beyond limits: understanding the relationship between loss and damage and human mobility and non-migration	*Lucy Szaboova*, University of Vienna (MSCA Fellow) & University of Exeter (Associate Fellow)
16:45 - 17:00	**Session discussion and reflection**	
17:00 – 18:30	**Drinks and social gathering**	**Victor J. Koningsberger building, Room 228.**

Day 2, July 1, 2026		
Time	**Event/Program**	**Moderated/Presented by**
08:30 - 09:00	**Registration**	**Victor J. Koningsberger building, Room 208**
09:00 - 10:00	**Online session 2** Microsoft Teams meeting Join: https://teams.microsoft.com/meet/384576731099554?p=Y0Iq4sGa8DnUM3vqmm Meeting ID: 384 576 731 099 554 Passcode: VY3CV66k	**Chair:** *Bishawjit Mallick, Utrecht University* **Co-chair:** *Ahmed Sabbir, Wageningen University and Research*
9:00 - 9:15	05. Education and climate resilience in Bangladesh: navigating compounded vulnerabilities in flood-prone regions	*Shuddha Srimoyee Das*[1], *Dr. Nidhi Nagabhatla*[2]; [1]United Nations University Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT) [2]United Nations University Institute on Comparative Regional Integration Studies (UNU-CRIS)

9:15 - 9:30	06. Mapping critical information voids in heatwave risk communication across Bangladesh	*Wafi Ara Faruqui[1] Nidhi Nagabhatla[1]*); *Dr. Santosh Vijaykumar[2]*; *Dr. Michael Craig[2]* ; [1]The United Nations University Institute on Comparative Regional Integration Studies; [2]Northumbria University)
9:30 - 9:45	07. Effect of a homestead food production and food hygiene intervention on enteric pathogen infection and environmental enteric dysfunction in young children, and their associations with growth	*Anna A. Müller-Hauser[1], Shafinaz Sobhan[1], Tarique Md. Nurul Huda[2], Sabine Gabrysch[1]*; [1]Potsdam Institute for Climate Impact Research (PIK), Germany; [2]Department of Public Health, College of Public Health and Health Informatics, Qassim University, Saudi Arabia
9:45 - 10:00	08. Rethinking the reciprocity of cultural heritage and climate change on the littoral landscape: a case study of khalifatabad, Bangladesh	*Samana Fatema*, University of Stirling, Scotland, UK
10:00 – 10:15	**Session discussion and reflection**	
10:15 - 10:45	**Coffee break**	**Victor J. Koningsberger building, Room 228**

10:45 - 12:00	**Session 3: Future-making & Development** *Victor J. Koningsberger building, Room 208*	***Chair:*** *Brooke Ackerly*, Vanderbilt University ***Co-Chair:*** *Mujibul Anam*, Griffith University
10:45 - 11:00	3.1 Future-making under livelihood uncertainties: The practice of tethered resilience in the peri-urban context of Khulna, Bangladesh	*Zita Bennis*, Utrecht University
11:00 - 11:15	3.2 How Community-based Disaster Risk Management (CBDRM) Influences Tetheredness: Empirical Evidence from Coastal Bangladesh	*Oishi Rani Saha*, *Nishad Nasrin, Md. Nasif Ahsan*, Economics Discipline, Khulna University; & *Bishawjit Mallick*, Utrecht University

11:15 - 11:30	3.3 Climate displacement, urban exclusion, and sustainability gap: water access in informal settlements of Dhaka and Chattogram	*Jill van Hellemond* - Partnership & Communication Manager - Better with water / Bangladesh
11:30 - 11:45	3.4 Agroecology and Resilience Livelihoods: Learning from locally led programmes	*Michael Hauser*, Institute of Development Research, University of Natural Resources and Life Sciences, Vienna, *Subash Gomes*, Caritas Bangladesh *& Philip Talman*, CAFOD
11:45 – 12:00	**Session discussion and reflection**	
12:00 – 13:15	**Lunch break**	**Victor J. Koningsberger building, Room 228**

13:15 - 14:45	**Session 4: Gender, health & climate justice** *Victor J. Koningsberger building, Room 208*	**Chair:** *Heleen Mees*, Utrecht University **Co-chair:** *Lucy Szaboova*, University of Vienna
13:15 - 13:30	4.1 Menstruating in the face of floods: an exploration of menstrual health management in Khulna, Bangladesh	*Julia van Vliet*, Utrecht University
13:30 - 13:45	4.2 Rethinking Climate and Development Narratives for Gender Justice in Bangladesh	*Amy French*, The Open University (UK)
13:45 - 14:00	4.3 “But what if your child dies?” Reproductive Labor and Loss in Climate Realities in Bangladesh	*Shahana Siddiqui*, Universiteit van Amsterdam, Netherlands BRAC James P. Grant School of Public Health, BRAC University, Bangladesh
14:00 - 14:15	4.4 A behavior change intervention on household-level food hygiene practices and microbial contamination of foods in rural Bangladesh	*Shafinaz Sobhan, et al*. Potsdam Institute for Climate, Germany

14:15 - 14:30	4.5 Visualizing Climate Resilience in the Bangladesh Sundarbans Through Art-Based Research	*Shapla Singha*, Drawing and Painting Discipline, Fine Arts School, Khulna University, Bangladesh
14:30 - 14:45	**Session discussion and reflection**	
14:45 - 15:15	**Coffee break**	**Victor J. Koningsberger building, Room 228**

15:15- 16:30	**Session 5: Key questions to look forward & closing** *Victor J. Koningsberger building, Room 208.*	*Niki Frantzeskaki*
15:15 - 16:10	Outlook by world café/ collected input on Dashboard	Organizers
16:10 - 16:20	Remarks of NWO	*Jelte Verberne*, Dutch Research Council
16:20 - 16:30	Closing Remarks	*Niki Frantzeskaki*, Pathways to Sustainability
16:30 - 18:00	Closing & drinks	**Victor J. Koningsberger building, Room 228**

ABSTRACTS

Access to Water and the Real Salinity Story: Reflections from Coastal Bangladesh

Dr Mujibul Anam*[1], Professor Brooke Ackerly[2],

[1]Public Health at School of Medicine and Dentistry, Griffith University, Australia; [2]Political Science, Vanderbilt University, USA

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Abstract

This article is based on a forthcoming book, Funding Justice: A Human Rights Approach to Climate Justice. While outsiders might be inclined to blame the water problem on environmental vulnerability due to the reasonable observation that the water table is saline and storms render surface water sources more vulnerable to climate change, and the social hierarchies can curtail access to fresh water, these observations do not tell us how to take responsibility for the impacts of climate change. Rather, both obstacles can and have been addressed with a form of governance that maintains the water source with responsibility, accountability, fairness, and transparency. Based on our recursive and collective research, we will show that the real salinity problem is a problem of everyday governance, rights enjoyment, and community harmony. Drawing on more than a decade of our research experience in the Khulna region, we will show that although Managed Aquifer Recharge projects have been implemented to address water scarcity, similar to many other interventions in the area, they have not achieved the expected success. By analysing the nature of this failure, our presentation will highlight the everyday struggles of people in this region. We will demonstrate that, due to existing social and structural systems, local communities continue to face persistent challenges. Therefore, water scarcity in this region must be understood in light of these underlying structural inequalities.

Scenario Based Drinking Water Demand Forecasting under Climate Change Uncertainties: A study on Dhaka City, Bangladesh

Md Faysal Tareq[1], Adriaan Mels[2,3], Romano Radjkoemar[3], Katarzyna Kujawa-Roeleveld[2], Kamonashish Haldar*[2]

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Highlights

- Single-variable based approach for water demand forecasting overlooks the future complexity
- Water pricing, population growth and climatic condition are crucial in determining the demand
- Forecasted models shows that by 2028 the study area would face drinking water shortage
- Under worst-case scenarios, demand could reach 4454 MLD, creating a significant supply-demand gap
- Scenario-based forecasting would be useful in diversifying the water extraction sources

A Pattern Language for Water Management: Naming Recurring Tensions to Make Complexity Actionable

Willem van Deursen, Myisha Ahmad* ,

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Abstract

Water management problems are rarely single-issue. Flood protection, infrastructure, governance, and community dynamics interact in ways that traditional models, guidelines, and policies cannot fully capture. This paper proposes a pattern language as a practical approach to understanding and acting within this complexity. Rather than treating recurring challenges as isolated failures, it identifies the underlying tensions that produce them across contexts, and names these tensions in a form that practitioners can recognise and discuss.

A pattern language serves two purposes. First, it makes complexity actionable by giving practitioners a shared vocabulary for situations that keep recurring despite best efforts to resolve them. Second, it builds institutional and sectoral memory: a way of holding accumulated experience across projects, borders, and generations, in a form that travels where evaluation reports and lessons-learned documents do not. Three illustrative patterns are presented: The Safety Paradox, where successful flood protection increases long-term risk by encouraging development in hazardous areas; Invisible Maintenance, where essential upkeep is systematically neglected because it succeeds by producing nothing visible; and The Two-Faced Map, where conflicting communication demands create irresolvable tensions between transparency and reassurance. Together they demonstrate how water management is shaped by interacting technical, social and institutional forces, and how naming them enables more honest and effective responses.

A pattern language is not a framework or checklist. It is an evolving, shared vocabulary grounded in practice, and its usefulness grows through use, discussion, and contribution. The current language contains 48 patterns. Practitioners are invited to test, critique, and extend it.

Rising Temperatures, Rising Vulnerabilities: Individual and Community Adaptation to Heat Stress in Urban Slums of Bangladesh

Zakia Sultana *[1,2,3], Heleen L.P. Mees[1], Bishawjit Mallick[2], Peter P.J. Driessen[1], Ajay Bailey [2]

[1]*Copernicus Institute of Sustainable Development, Utrecht University, The Netherlands,* [2]*Human Geography and Spatial Planning, Utrecht University,* [3]*Department of Environmental Science and Disaster Management, Gopalganj Science and Technology University, Bangladesh*

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Abstract

Rising temperatures and intensifying heat stress disproportionately affect low-income urban communities, exacerbating existing inequalities and vulnerabilities amid accelerating climate risks. Slum residents, facing unplanned housing structures and limited access to essential services like water, electricity, and gas, adopt individual and community-driven adaptation strategies to cope with extreme heat. However, the conditions that shape their ability to adapt remain largely underexplored. Employing the Everyone's Adaptation framework, this study examines the key conditions that shape individual and community-level responses to heat stress. Data were collected through a qualitative mixed-methods approach, employing focus group discussions, in-depth interviews, expert interviews, and field observations conducted between June and August 2024 in Korail slum, Dhaka, Bangladesh. Findings indicate that individual resources, such as income, are pivotal to adaptation, while social capital supports community resilience through resource sharing and access to key facilities and services. However, persistent inequalities in resource distribution exacerbate individual vulnerabilities, intensifying the local impacts of global climate change. Participants emphasize the need for long-term adaptation strategies, such as improved housing conditions, over temporary interventions like cooling centers. The findings highlight the necessity of gender-specific and age-sensitive measures, as women face heightened challenges due to the dual responsibilities of household management and paid work and older adults face mobility challenges to access shaded spaces. By analyzing eight conditions across individual, community, and collective levels, this study

advances understanding of everyday adaptation practice to heat stress and contributes to more equitable, context-specific adaptation policies that enhance urban resilience and address climate-related vulnerabilities.

Climate Change and Changing Sources of Safe Drinking Water: The Poetics and Politics of Development in Sundarbans

Md Rahamatullah*

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Abstract

This paper examines the role of development brokers in the commodification of drinking water in the deltaic Sundarbans of Bangladesh. Building on Mosse's idea of "cultivating development" in this paper, I show emerging water infrastructure to understand how safe drinking water projects are being implemented as measures to mitigate and adapt to climate change by the development brokers, in which people are moving away from natural sources (ponds) of drinking water toward "water treatment plants" and "rainwater harvesting". Thereby converting drinking water into a commodity. This work is based on ethnographic fieldwork conducted from December 2023 to February 2024 and from May 2025 to January 2026 across three villages in Shyamnagar Upazila, Satkhira district. I utilise in-depth interviews and participant observation to understand the poetics and politics of development. In this paper, I argue that in the coastal area of the Sundarbans, developmental interventions around safe drinking water projects are paradoxical and are cultivated through a "relational-dialectical process". In this process, development brokers identify a problem and initiate a solution, which, in turn, creates a new problem. Therefore, it produces a "recursive development regime" and sustains itself through the reproduction of crises.

Financing Climate-Resilient Infrastructure under Multi-Hazard Risk: A PPP Based Framework for Bangladesh

Md. Mainul Islam[1*], Tawhid Amanullah[2]

[1]Public Works Department, Bangladesh, [2]DotlineVisions, Sweden

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Abstract

"Climate change is intensifying multi-hazard risks in Bangladesh, presenting acute challenges to infrastructure systems and economic development. Although substantial investments target infrastructure, current financing practices often fail to integrate multi-hazard risk analytics, undermining resilience outcomes. This paper introduces an integrated framework for financing climate-resilient infrastructure through Public-Private Partnerships (PPP), synthesizing empirical data from MDB-funded projects and national programs. By analyzing coastal transport and urban water supply, the study demonstrates how different risk typologies influence design choices and contractual models. Findings show that while physical asset risks require engineering-led resilience and public risk-sharing, systemic service risks necessitate adaptive, performance-based PPP models. Ultimately, climate risk reshapes project bankability, highlighting the necessity of blended finance. This research provides a practical, risk-informed framework for policymakers and investors to support sustainable infrastructure development."

Modeling the Influence of Blue-Green-Gray (B2G) Infrastructure on Urban Temperature Using Machine Learning in Khulna City

Mohammad Ismail Hossain*, Md Refath Hossan, and Zahid Hassan Shaon

Institute of Disaster Management, Khulna University of Engineering & Technology, Khulna-9203, Bangladesh

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Abstract

Rapid urban growth replaces water and vegetation with heat-storing gray surfaces. This study quantified blue-green-gray (B2G) effects on pre-monsoon land surface temperature (LST) in Khulna City Corporation, Bangladesh, for 2015, 2020, and 2025. Landsat 8/9 Collection 2 Level-2 imagery was processed in Google Earth Engine to derive LST, NDVI, NDWI, MNDWI, NDBI, and BSI. Threshold-based B2G classes, 11 x 11-pixel fractions, and distances to water and green space were used in Random Forest regression and a cooling-priority index. Mean LST increased from 34.75 °C in 2015 to 37.51 °C in 2020 and remained 36.44 °C in 2025; observed map maxima increased from 40.04 to 44.52 °C. Gray area expanded from 3.75 to 8.25 km² (+120.0%), while green and blue areas declined by 13.1% and 11.5%. Combined high and very-high thermal-intensity area increased from 6.57 to 12.11 km², and high/very-high cooling-priority area increased from 1.18 to 4.44 km². Models achieved R^2 = 0.837-0.884, RMSE = 0.832-1.014 °C, and MAE = 0.621-0.762 °C. NDBI showed the strongest positive LST association in 2020 and 2025, whereas blue fraction and MNDWI were negative. The results support connected green corridors, waterbody protection, shade trees, pocket parks, and cool-surface interventions.

When Projects End, What Remains? Rethinking Adaptation in Coastal Bangladesh

Rawnak Jahan Khan Ranon*, Samiha Saleha, Savio Rousseau Rozario

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Abstract

Coastal Bangladesh has a long history of confronting climate risks, leading intermediaries to shift from reactive relief to more proactive adaptation. This study explores how these intermediary strategies evolve to support resilience, considering how communities themselves understand and experience these changes. Using a qualitative approach, the research draws on 40 Key Informant Interviews and 75 In-Depth Interviews conducted in Shyamnagar and Kalapara. In these two coastal sub-districts, NGOs have been active for decades. The findings show a gradual shift from short-term material support to approaches that emphasize relationships, collective agencies, and long-term social learning. While strategies such as livelihood diversification are widely promoted, locally-embedded knowledge emerges as a more lasting form of resilience that continues beyond project timelines. Simultaneously, the study identifies a clear responsibility imbalance, where communities increasingly bear the burden of managing climate risks, despite ongoing gaps in state accountability and insecure land tenure. The results also highlight that what works in one setting does not easily transfer to another, making it difficult to standardize interventions for large-scale, donor-driven programs. Strengthening long-term adaptation needs better coordination among local agencies, institutional support, and political commitment to help communities cope with shocks and create secure, stable futures.

How Loss and Damage Cascades: Protracted displacement in Bangladesh and what can be done about it

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Abstract:

Protracted displacement in the context of climate change is accelerating in many climate-vulnerable developing and least developed nations, including Bangladesh, leaving tens of millions of people to suffer some of the worst forms of loss and damage, often anonymously and without recourse to climate adaptation and development programming.

Taking Bangladesh as a case study and drawing on qualitative field research data from three different displacement contexts in the country, this paper explores the nexus of climate change, displacement and loss and damage, focusing on the causal interplay between protracted displacement and cascading loss and damage. When the multidimensional needs of recently displaced people are not addressed through multifaceted durable solutions programming from the start of displacement, displacement leads to further losses and damages that can cascade across time, locations and even generations. The adverse impacts often compound in a process this paper refers to as 'disynergy', which can lead to erosive coping behaviours as people struggle to survive. Through this adverse cycle, displacement can become 'protracted', leaving people further impoverished, vulnerable and unable to move toward a lasting solution to their displacement.

Understanding the causal pathways by which multidimensional losses and damages associated with displacement can cascade is critical to developing preventative and restorative programming that can deliver lasting solutions to people at risk of being left behind.

Life Satisfaction and (Non-) Migration Aspiration under Environmental Stress in Southwest Bangladesh

Tolina Addisu*

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Abstract

Life satisfaction is fundamental to one's well-being, and it is also the basis for mobility decisions. The paper examines determinants of life satisfaction and explores its relationship with migration aspiration under environmental extremes. The study is based on structured interviews with 190 households in Southwest Bangladesh. An independent-samples t-test and binary logistic regression are used to assess the relationship between life satisfaction and (non-) migration aspiration. A notable difference is found between stayers and migrants. The average life satisfaction of respondents who prefer to stay is higher than that of those who aspire to migrate. Stayers have also a better housing condition, a higher mean age and lived longer in their village. The ordered logistic regression shows that income, education and duration of stay has a statistically significant effect on life satisfaction. The findings of the research suggest that only a large change in income is likely to alter the life satisfaction and, hence, the migration aspirations of the population living in environmentally susceptible areas such as Bangladesh. In general, life satisfaction, age and housing condition determine (non-) migration aspiration, but income, education, and length of stay do have indirect effects. Thus, the study uncovers how migration aspirations are formed in the face of environmental extremes, helping better to understand the adaptation mechanisms of at-risk population.

Beyond Limits: Understanding the Relationship between Loss and Damage and Human Mobility and Non-Migration

Lucy Szaboova*

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Abstract

My proposed contribution connects insights from my earlier empirical, conceptual, and policy-engaged research in Bangladesh, with my ongoing research funded by a Marie Skłodowska-Curie Actions (MSCA) Fellowship. During my past empirical research in Bangladesh, I employed visual ethnography and participatory techniques to examine how low-income migrants in urban areas experience insecure tenure, environmental hazards, social exclusion, and political marginalisation. These insights informed subsequent conceptual work on evaluating migration as adaptation, identifying trade-offs in wellbeing, equity, and sustainability as signals of potential limits to adaptation that may result in l&d. Building directly on these empirical and conceptual foundations, my ongoing MSCA research explicitly links climate mobility to l&d. First, by developing a critical framework for analysing the relationship between climate-related mobility and loss and damage (l&d). Second, by implementing this framework through empirical research in Bangladesh. Using participatory, qualitative, and deliberative methods, the project investigates socially differentiated experiences of economic and non-economic l&d in contexts of relational and evolving mobility and immobility. It aims to inform policies, interventions, and investment decisions by co-producing context-specific, equitable responses to complex and evolving l&d.

Education and Climate Resilience in Bangladesh: Navigating Compounded Vulnerabilities in Flood-Prone Regions

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Abstract

Bangladesh is undergoing rapid environmental and socio-economic transformations, with climate change intensifying existing development challenges. This study examines the intersection between school education and climate resilience using a mixed-methods approach, integrating thematic analyses of documentaries and stakeholder interviews with geospatial mapping of student-teacher ratios (2021-2023). The findings reveal a network of compounded vulnerabilities disrupting education in flood-prone regions of Bangladesh. Floods can affect access to education through infrastructural damage, poor water and sanitation conditions, and livelihood insecurities, alongside social challenges such as child marriage, child labour, displacement and migration. These factors reinforce poverty and limit adaptive and coping capacities thereby reducing climate resilience. A feedback loop mechanism of education and climate resilience has been observed: restricted education increases vulnerabilities and weakens resilience, while improved education enhances awareness, livelihood opportunities, and community-based adaptation practices, strengthening resilience, and enabling continued access to education. This study contributes to ongoing discussions on climate risk, inequality, and sustainable development in Bangladesh by emphasising the need for integrated, multi-stakeholder approaches that connect research, policy, and practice to address interlinked challenges.

Mapping Critical Information Voids in Heatwave Risk Communication across Bangladesh

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Abstract

Since 2023, Bangladesh has been facing increasingly intense and prolonged heatwaves, amplifying public health vulnerabilities and exposing deficiencies in heat-risk communication strategies. This study investigates critical information voids in heatwave communication to inform targeted policy interventions. A cross-sectional online survey (August to December 2025 reached 471 adults aged 18–65 years, yielding 299 complete responses for analysis). The questionnaire assessed four dimensions of information voids: quantity, quality, source and channel; alongside information self-sufficiency, with descriptive statistical analysis revealing systemic gaps. Findings reveal a significant difference ($p < .001$) across the dimensions, with lower scores for quantity (mean = 2.01) and quality (mean = 1.98), and higher scores for source (mean = 4.53) and channel (mean = 4.21). This indicates that rather than an absolute dearth of information, voids persist in the sources and channels through which information is delivered, limiting the use and actionability. Low information self-sufficiency among respondents further exacerbates these gaps, underscoring a misalignment between information supply and public needs. Strengthening system-level heat-risk communication requires investments in public education campaigns to build heat-risk literacy and self-sufficiency, aligning with the Bangladesh Delta Plan 2100 and National Adaptation Plan to strengthen climate-resilient health systems.

Effect Of a Homestead Food Production and Food Hygiene Intervention on Enteric Pathogen Infection and Environmental Enteric Dysfunction in Young Children, and Their Associations with Growth Outcomes

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Abstract

Enteric pathogen infections and environmental enteric dysfunction (EED) are closely linked to undernutrition in young children. The Food Hygiene to Reduce Environmental Enteric Dysfunction (FHEED) study, nested within the Food and Agricultural Approaches to Reducing Malnutrition (FAARM) trial in rural Habiganj, Sylhet, Bangladesh, evaluated a combined homestead food production and food hygiene intervention. We assessed enteric pathogen prevalence and EED biomarkers in young children, examined intervention effects, and investigated associations with child growth outcomes. Enteric pathogen prevalence was high despite low diarrhea prevalence, with co-infections being common. The intervention did not reduce pathogen burden or EED biomarkers. Specific pathogens were associated with elevated EED biomarkers. Protozoan infections were mainly associated with impaired linear growth and viral infections with impaired ponderal growth, while there was less evidence that bacterial infections were associated with anthropometric outcomes. Our findings indicate that a combined food production and hygiene intervention did not sufficiently reduce enteric pathogen exposure and EED in a resource-poor setting. In the face of climate change, with water insecurity, rising temperatures, and extreme weather events likely to increase the burden of enteric infections, comprehensive strategies that address key transmission pathways are urgently needed to improve child growth and developmental outcomes.

Rethinking the Reciprocity of Cultural Heritage and Climate Change on the Littoral Landscape: A Case Study of Khalifatabad, Bangladesh

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Abstract

This research put 'Cultural Heritage Practices' of a littoral landscape with historic value in the centre of 'Heritage in Climate Change Paradox Discussion' to challenge the authorised heritage discourse and advocate for a more inclusive approach under climate change. Extensive ethnography, such as interviews, focus group discussions, and digital documentation, has been conducted in 8 villages of Modern-day Bagerhat (Khalifatabad) to explore how different living heritage practices have adapted under climate change. This research demonstrates that cultural heritage practices are not disappearing under climate pressure, they are adapting. This adaptation is reshaped by direct and indirect effects of anthropogenic climate change (such as a change in the agricultural cycle, prawn cultivation, and increasing salinity) and dominant socio-political influence. Based on critical heritage theories, this research challenges the authorised heritage management and advocates for a community-centric co-management system where people can develop cultural resilience through their everyday heritage, even under extreme climate conditions.

Future-Making under Livelihood Uncertainties: The Practice of Tethered Resilience in the Peri-urban Context of Khulna, Bangladesh

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Abstract

Peri-urban areas in rapidly urbanizing regions are increasingly characterized by livelihood uncertainties. In the peri-urban areas surrounding the growing city of Khulna, Bangladesh, households face changing climatic conditions, shifting economic opportunities, and limited governance support. Despite these uncertainties, many households remain tied to place. This research examines how livelihood uncertainties influence households' future-making strategies and how different sources of knowledge contribute to tethered resilience. The study applies the concept of tethered resilience exploring how households combine rootedness with adaptive practices, including migration strategies. A mixed-methods design was used across three peri-urban regions, combining household surveys (n = 315) with semi-structured interviews. Preliminary results indicate that environmental uncertainties are most frequently experienced, while political-institutional uncertainties most significantly reduce households' capacity for future-making. Access to intergenerational, interpersonal, and institutional knowledge plays a central role in enabling households to navigate livelihood uncertainties while maintaining rootedness. By examining how households combine local knowledge, lived experience, and institutional support to navigate uncertainty, this research contributes to broader debates on climate adaptation, sustainable livelihoods, and tethered resilience in rapidly transforming peri-urban environments.

How Community-based Disaster Risk Management (CBDRM) Influences Tetheredness: Empirical Evidence from Coastal Bangladesh

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Abstract

Community-based Disaster Risk Management (CBDRM) is widely endorsed as a pathway to climate-resilient development. But how such activities shape people's decisions to stay or migrate in high-risk areas has received minimal attention. Beyond the binary dimensions of migration and non-migration, tetheredness refers to the condition of being socially, emotionally, or spatially bound to a place in ways that constrain mobility, choice, or independent action. This study examines whether CBDRM influences individual decisions to tether in climate-vulnerable coastal areas by strengthening emotional and social attachment to place. Employing a mixed-methods empirical research design, this study analyzes participation in CBDRM activities, including early warning systems, cyclone shelters, training programs, and food-for-work schemes, and how this relates to emotional and social tethering. Preferences for staying, temporary migration, or permanent relocation are used as outcome variables. Preliminary findings suggest that participation in CBDRM activities is strongly associated with greater emotional and social tethering, reinforcing attachment to place and community networks, which are associated with a higher likelihood of preferring to tether despite recurrent climate risks. The findings suggest that CBDRM may shape tethering behavior not only through risk reduction but also by reinforcing place-based attachment and social embeddedness.

Climate Displacement, Urban Exclusion, and Sustainability Gap: Water Access in Informal Settlements of Dhaka and Chattogram

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Abstract

Bangladesh's informal urban settlements are growing rapidly, driven in large part by climate-induced displacement from flood-prone and coastal areas. Yet despite this predictable and accelerating trend, these communities remain systematically excluded from formal urban planning, infrastructure investment, and basic service delivery. Drawing on 2 years of field experience living and working in Dhaka as a partnership manager with better with water, this contribution examines how prevailing NGO intervention models, typically one-off infrastructure projects with no maintenance plan, leave communities managing broken systems once donors move on. With international development funding increasingly scarce, the absence of models that cover operational costs (not just installation) leaves communities permanently at risk. Better with water's social enterprise model offers an alternative: generating revenue through water services to fund ongoing operations, embedding long-term sustainability. Beyond financing, the contribution analyses the disconnection between urban policy frameworks and the lived realities of climate-displaced residents, questioning how funding flows, governance structures, and service delivery models can evolve toward genuine urban inclusion. It argues for flexible, rights-based approaches that recognize informal settlements as permanent features of Bangladesh's urban future and their residents as entitled to basic services.

Agroecology and Resilience Livelihoods: Learning from Locally Led Programmes

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Abstract

Caritas Bangladesh would like to present the findings of recent research, carried out in cooperation with BOKU University and CAFOD. The Building Resilience through Agroecology for Coastal Emergencies (BRACE) study highlighted how agroecological farming enhanced household resilience to Cyclone Remal, which made landfall in May 2024. BRACE compared 297 Caritas Bangladesh programme participants with 80 non-participants across three villages in Kalapara Sub-District. Despite similar exposure, programme households experienced roughly half the level of damage across crops, livestock, infrastructure, and income. Findings show that sustained participation in agroecological programmes through Farmer Field Schools, seed banks, and community networks was the strongest predictor of preparedness, reduced damage, and recovery, outweighing factors like land size or location. Programme households demonstrated higher anticipatory capacity and were more likely to adopt effective pre-cyclone measures. Post-disaster, they relied more on savings and less on debt, enabling faster and more adaptive recovery. The study highlights a clear pathway linking agroecological transition, knowledge, and social capital to resilience, positioning agroecology as a scalable, cost-effective strategy for climate adaptation. Our contribution would touch upon several of the conference themes specified by CAN, including climate risk, livelihoods, adaptation, resilience, governance and policy.

Menstruating in the Face of Floods: An Exploration of Menstrual Health Management in Khulna, Bangladesh

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Abstract

Menstrual health is a crucial part of the health of people who menstruate (PM). Therefore, it is imperative that menstrual health management (MHM) is holistically defined, including a thorough understanding of the social aspect of menstruating. Menstruation warrants a great deal of taboo, stigmatisation and secrecy, inhibiting PM from managing their periods safely and comfortably. MHM becomes more problematic during floods, as access to the necessary materials and facilities is scarcer. Therefore, this study seeks to work out the ways in which social norms with regard to MHM function, and especially how they may contribute to challenges during floods in Khulna, Bangladesh. Using a sequential mixed methods research design, this study builds on in-depth interviews (N=27) and surveys (N=417). The results of this study indicate that social norms and perceptions could pose a serious constraint to people who menstruate, especially during floods. Restrictive social norms, a persistent lack of menstrual materials and facilities, and frequent flooding of the region arguably add psychological pressure to menstruation and increase risk factors of physical-, mental-, and intimate health problems. Social norms and perceptions around MHM are often overlooked by researchers, policymakers and aid-workers. This study seeks to overcome this blind spot by illuminating the social dynamics of MHM and how they may restrict people who menstruate, particularly during floods.

Rethinking Climate and Development Narratives for Gender Justice in Bangladesh

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Abstract

In Bangladesh, climate disruption unfolds through intertwined political, economic, and gendered inequalities, revealing that environmental change cannot be separated from the power structures shaping daily life. This contribution introduces the Climate Narrative Violence Framework (CNVF) to analyse how interconnected forms of harm - structural, cultural, epistemic, and discursive violence - shape women's everyday lives in coastal Bangladesh. Drawing on research on climate development interventions, gendered vulnerability, and postcolonial knowledge production, this research argues that climate impacts are mediated through entrenched power relations that both produce and naturalise inequality. Development initiatives framed as adaptation, such as shrimp aquaculture, often exacerbate dispossession, marginalise women's knowledge, and reinforce narratives that depict Bangladesh as the epicentre of global climate crisis. These narratives often obscure global historical responsibility and silence local agency. By foregrounding women's everyday practices of coping, care, and labour, the CNVF highlights how climate governance can reproduce recursive cycles of harm while overlooking the subtle, daily forms of agency that sustain communities. This framework invites researchers, policymakers, and practitioners to rethink climate and development narratives in Bangladesh and to centre local knowledge, gendered experiences, and structural justice in future interventions.

“But what if your child dies?” Reproductive Labor and Loss in Climate Realities in Bangladesh

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Abstract

This paper is based on an initial scoping study of char (river islands) communities of northern regions of Bangladesh, critically looking at the reproductive regimes that are designed and disseminated in a top-down manner, reflecting very little of their climate realities. Ethnographic accounts of community health program and an NGO’s floating hospital demonstrate reproductive loss as a part of emotional geographies (Sultana, 2011) that is absent in health intervention discourse. Losing a child, as the char women explained, is a part of their lives; so is child marriage and not having access to maternal care services on time. Government directive for all births to take place at a birthing center (public or private) took no consideration of the topography. This raises serious questions of whether policymakers understand their own country and its people. Ethnographic engagement reveals the social cohesion that is needed to survive the climate-induced frequent floods, at the heart of which is early marriage, multiple pregnancies, and social production of gender as survival mechanism. This paper demonstrates the colonial and extractive nature of global, national, and local assemblage of reproductive politics and governance that travel and shape people’s reproductive health options. This paper explores the question of can reproductive regimes ensure climate justice to women within these reproductive regimes.

A Behavior Change Intervention on Household-Level Food Hygiene Practices and Microbial Contamination of Foods in Rural Bangladesh

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Abstract

As part of the Food Hygiene to Reduce Environmental Enteric Dysfunction (FHEED) study, nested within the Food and Agricultural Approaches to Malnutrition (FAARM) trial, we designed, implemented, and evaluated a behavior change intervention targeting household-level food hygiene practices in rural Habiganj, Sylhet, Bangladesh. Delivered alongside a three-year homestead food production program and using emotional drivers, the eight-month intervention achieved high reach and improved key behaviors, including handwashing with soap, use of clean utensils, safe cooking or reheating, and safe food storage. However, few mothers consistently practiced all recommended food hygiene behaviors and adherence declined after the intervention ended. Microbial contamination was widespread in children's food, with nearly half of samples testing positive for E. coli. Qualitative findings indicate that, while mothers were very motivated, consistent practice was constrained by time, competing household priorities, and limited access to water and essential infrastructure. Sustained behavior change, therefore, requires integrated approaches combining behavior change strategies, infrastructure improvements, and stronger community engagement. In the context of climate change, as water insecurity and rising temperatures are likely to increase food contamination risks in resource-poor settings, strengthening food hygiene practices is critical for protecting children's health and nutrition outcomes.

Visualizing Climate Resilience in the Bangladesh Sundarbans Through Art-Based Research

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Abstract

The coastal Sundarbans region of Bangladesh is increasingly threatened by climate change through cyclones, salinity intrusion, ecological degradation, and livelihood insecurity. These challenges disproportionately affect women and marginalized communities, whose lived experiences are often overlooked in mainstream climate discourse. This research explores how art-based and participatory visual methods can contribute to documenting and communicating local experiences of climate adaptation and resilience. Using visual art, photography, storytelling, and community engagement practices, the study investigates how creative methodologies can function as tools for climate communication, cultural preservation, and public engagement. The research particularly focuses on women's narratives and everyday adaptive strategies within climate-vulnerable communities in coastal Bangladesh. The paper argues that artistic research offers alternative approaches to climate knowledge production by connecting emotional, cultural, and social dimensions of environmental change. It further highlights the importance of interdisciplinary collaboration between art, research, and community participation in shaping inclusive climate adaptation dialogues in Bangladesh.

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