Welcome
To My Talk

Research and Academic Collaboration
With UCL IRDR

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Institute for Risk & Disaster Reduction (IRDR)
University College London (UCL), UK

15 May 2019
UCL is London's leading multidisciplinary university, with more than 13,000 staff and 38,000 students from 150 different countries. Founded in 1826 in the heart of London, UCL was the first university in England to welcome students of any religion and the first to welcome women on equal terms with men.
<table>
<thead>
<tr>
<th>Rank</th>
<th>University Name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MIT (Massachusetts Institute of Technology)</td>
<td>United States</td>
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<tr>
<td>2</td>
<td>Stanford University</td>
<td>United States</td>
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<td>3</td>
<td>Harvard University</td>
<td>United States</td>
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<tr>
<td>4</td>
<td>California Institute of Technology (Caltech)</td>
<td>United States</td>
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<td>5</td>
<td>University of Oxford</td>
<td>United Kingdom</td>
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<td>6</td>
<td>University of Cambridge</td>
<td>United Kingdom</td>
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<tr>
<td>7</td>
<td>ETH Zurich - Swiss Federal Institute of Technology</td>
<td>Switzerland</td>
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<td>8</td>
<td>Imperial College London</td>
<td>United Kingdom</td>
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<td>9</td>
<td>University of Chicago</td>
<td>United States</td>
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<tr>
<td>10</td>
<td>UCL (University College London)</td>
<td>United Kingdom</td>
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Masters Programmes

- Risk, Disaster and Resilience MSc
- Risk and Disaster Science MSc
  (Data Science and Management Pathway are available)
- Space Risk and Disaster Reduction MSc
- Risk and Disaster Reduction MRes

Duration: Full-time 1 year    Part-time 2 years

“I supported London First and the London Fire Brigade by providing scientific evidence for their project whilst doing my MSc.”
Max Kaiser
Senior Consultant in Cyber Risk at Deloitte Germany
IRDR MSc 2015-16

Developing leaders and experts in risk and disaster reduction
Scholarships for overseas-fee students

UCL IRDR call for 4 scholarships for overseas fee paying UCL IRDR masters students who begin their courses in September 2019 is now open. Scholarship values are £12,500 (x2) and £5,000 (x2), all paid towards overseas fees.

Application deadline is 29th April 2019.

UCL IRDR MSc in Risk Disaster and Resilience applicants are eligible for the Commonwealth Shared Scholarship Scheme.

The scholarship covers full tuition fees, a maintenance allowance, and air travel to and from the UK at the beginning and end of the programme for students from the Commonwealth.

Applications are open until 14th March 2019.
https://www.ucl.ac.uk/prospective-students/scholarships/graduate/overs-master/cwss
Academic Background

PhD in **Disaster Risk Reduction (DRR)** – 2017
Institute for Risk and Disaster Reduction, University College London (UCL), **UK** [Commonwealth Scholar]

MSc in **Geospatial Technologies** – 2011
Joint degree awarded by (European Commission Scholar):
- Westfälische Wilhelms-Universität Münster, **Germany**
- University of Jaume I, Castellón, **Spain**
- University of New Lisbon, Lisbon, **Portugal**

Bachelor of **Urban and Regional Planning** – 2008
**Bangladesh** University of Engineering and Technology (BUET)
**Publication Strength**

62 scholarly publications: **27 peer-reviewed articles**

**Citations:** Google Scholar = **695** & Scopus = **322**

**h-index:** Google Scholar = **14** & Scopus = **9**

**Notable Journals Covered:**

The **Lancet Global Health** [Impact factor = 17.686]

**The Lancet** [Impact Factor: **53.254**]

“The **UCL Lancet Commission on Migration and Health:**

*The health of a world on the move*”!

Collaboration with the UCL Institute for Global Health (IGH)
Teaching and Supervision Experience

Chittagong University of Engineering & Technology – Disaster Management

University of Dhaka – Risk Sensitive Landuse Planning, and Hazard Analysis Lab

Bangladesh Institute of Planners (BIP) – Professional GIS Certificate Course

• Quantitative & Qualitative Research Methods
• Natural Hazards Risk
• Fundamentals of Statistical and Geospatial Analysis
• Advanced Geoinformatics in Risk Modelling
1. **Project Coordinator:** "Resilient Futures for the Rohingya Refugees"; £500,000 funded by the Royal Society (Grant Scheme: Challenge-led Grants); March 2019 – September 2021.

2. **Project Coordinator:** "Rohingya Journeys of Violence and Resilience in Bangladesh and its Neighbours: Historical and Contemporary Perspectives"; £300,000 funded by the British Academy (Grant Scheme: Sustainable Development Programme 2018); September 2018 – December 2020.

3. **Project Coordinator:** "The Rohingya Exodus: Issues and Implications for Stability, Security and Peace in South Asia"; £50,000 funded by the British Academy (Grant Scheme: Tackling the UK's International Challenges 2017); January 2018 – March 2019.

4. **Researcher-Investigator:** "INSIRE: Indonesia School Programme to Increase Resilience"; £120,000 funded by the Newton Fund Institutional Links Programme and British Council in the UK; March 2018 – December 2019.

5. **Project Coordinator:** "Response of Disasters through Resilience: Addressing Extreme Climatic Disasters to Annihilate the Insecurity of Food, Nutrition and Livelihood – A Study on Disaster Affected Areas in Bangladesh"; £100,000 funded by the UNDP China and International Center for Collaborative Research on Disaster Risk Reduction (ICCR-DRR), Beijing, China; January – December 2017.

6. **Researcher-Investigator:** "Increasing Resilience to Environmental Hazards in Border Conflict Zones"; £170,795 funded by the UK Natural Environment Research Council (NERC), the Arts & Humanities Research Council (AHRC), and the Economic & Social Research Council (ESRC); January – December 2017.

7. **Project Coordinator:** "Evaluation of the Vulnerability to Resilience (V2R) Programme"; £20,000 funded by the British Red Cross (BRC); January – May 2016.

8. **Project Coordinator:** "Developing a Dynamic Web-GIS based Early Warning System for the Communities Living with Landslide Risks in Chittagong, Bangladesh"; US$25,000 funded by the USAID and NASA. Implemented by BUET-Japan Institute of Disaster Prevention and Urban Safety (BUET-JIDPUS), Bangladesh University of Engineering and Technology (BUET); June 2014 – September 2015.
Spatial Distribution of Land Surface Temperature (LST)
A Markov chain is a discrete random process with the property that the next state depends only on the immediately preceding state(s) [6].
Artificial Neural Network (MLP)
Simulated Land Cover Dynamics (MLP_Markov Model)

Approximately 49% and 57% of DMP area will be converted into ‘Built-up Area’ land cover type in 2019 and 2029, respectively.
Simulating the Future LST Maps (2019 and 2029)

Approximately **56%** and **87%** of DMP area will fall in the **Highest Temperature Zone (>= 30°C)** in 2019 and 2029, respectively.
Landslide Work

CHD Area = 21,000 sq. km; accommodating 12 million people

Hill ranges from 30 – 1000 metres
Hill Cutting
Indigenous Tribal Communities
Study Area
# Landslide Disasters

<table>
<thead>
<tr>
<th>Date</th>
<th>Location of Landslides</th>
<th>Rainfall Sequence</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 July 2015</td>
<td>South Baharchharha area, Cox’s Bazar</td>
<td>682 mm rainfall in 6 days</td>
<td>5 fatalities, and 4 houses buried</td>
</tr>
<tr>
<td>13 June 2017</td>
<td>All five hill districts</td>
<td>300 mm rainfall in 24 hours</td>
<td>159 killed and 88 injured</td>
</tr>
<tr>
<td>25 July 2017</td>
<td>Sadar and Ramu Upazila, Cox’s Bazar</td>
<td>677 mm rainfall in 6 days</td>
<td>5 killed and 5 injured</td>
</tr>
<tr>
<td>11 June 2018</td>
<td>Ukhia Rohingya camps</td>
<td>459 mm rainfall in 4 days</td>
<td>1 killed and 500 injured</td>
</tr>
<tr>
<td>12 June 2018</td>
<td>Maheshkhali Upazila</td>
<td></td>
<td>1 killed</td>
</tr>
<tr>
<td>25 July 2018</td>
<td>Miar Ghona, CBM and Dokkhin Mithachori, Ramu Upazila</td>
<td>228 mm rainfall in 24 hours</td>
<td>5 killed</td>
</tr>
</tbody>
</table>
Basic Information

Landslide ID: 05
Landslide Location: Tanker Pahar, Moti Jharna
Coordinates: 22°20'54.27''N, 91°48'51.60''E
Datum: WGS 1984
Elevation (m): 41.18
Area of Displaced Mass (sqm): 331.84
Rainfall: Unknown

Source: Field Survey, August 2014

Landslide Mechanism

Type of Movement: Slide
Style: Single
Water Content: Moist
Material: Soil/Earth

Land Cover/Use Type (%):
Herbaceous vegetation is the Primary land cover of Tanker Pahar. Forest/woodland type is also visible in this hill.

Causes of Movement:
Hill cutting is the major issue that caused landslide in this area and intense rainfall acted as a triggering factor for landslide.

Landslide History and Future Risk of Landslide

Landslide in this site occurred in 1982, 1989, 1991, 1994, 1996 and 2013. 10 houses got damaged and 22 people died due to landslide at different periods. Utility facilities were highly damaged in this site. Economic activities were hampered so does the social life of people. Environment has to be severely damaged. Still there are many houses located at the down slope of the hill. This site has been found to be sandy. The escarpment slope is found to be near vertical. The mass is a part of upper portion. Vertical Slope characteristics can be considered as a triggering factor to future landslide for this hill. Settlements located at the down slope of this hill huge risk of massive landslide. The risk is high (Field survey, August 2014).
Land Cover Mapping

(a) 1998

(b) 2001

(c) 2017

(d) 2018

Legend

Land cover

Forest
Shrubland
Grassland
Cropland
Barrenland
Waterbodies
Built-up areas

Legend

Land cover

Forest
Shrubland
Grassland
Cropland
Barrenland
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Landslide Susceptibility Mapping (LSM)

Self-Organizing Map (SOM)

[Susceptibility Index]

- High: 1
- Low: 0

Legend:
- Camp Area
- First Priority Zone
- Second Priority Zone
- Third Priority Zone
- Very Low
- Low
- Moderate
- High

Kilometers
A hazard class (no warning vs. warning state) is assigned based on the assumption that the higher the susceptibility, the lower the rainfall.
Early Warning System

(a) Scenario 1: Low Rainfall (R1) [Zone 4] = 6 cells affected
(b) Scenario 2: Medium Rainfall (R2) [Zones 4+3] = 20 cells affected
(c) Scenario 3: High Rainfall (R3) [Zones 4+3+2] = 28 cells affected

Legend:
- Green: No-Warning State
- Blue: Warning State
Early Warning System
Early Warning System

URL: www.landslidebd.com

Rainfall Amount (mm)
[Consecutive 5 Days Cumulative]

- Low Rainfall (R1) = 95 – 220
- Medium Rainfall (R2) = 221 – 345
- High Rainfall (R3) > 345
- No Warning
18 Soldiers were killed in flash flooding in July 2015.
PRA Activities
Indigenous mountain people’s risk perception to environmental hazards in border conflict areas

Bayes Ahmed\textsuperscript{a,b,*}, Peter Sammonds\textsuperscript{a,b,c}, Naomi M. Saville\textsuperscript{d}, Virginie Le Masson\textsuperscript{e}, Kavita Suri\textsuperscript{f}, Ghulam M. Bhat\textsuperscript{g}, Naveen Hakhoo\textsuperscript{g}, Tsering Jolden\textsuperscript{h}, Gulzar Hussain\textsuperscript{i}, Kuenga Wangmo\textsuperscript{i}, Bindra Thusu\textsuperscript{c}

\textsuperscript{a} Institute for Risk and Disaster Reduction, University College London (UCL), UK
\textsuperscript{b} UCL Humanitarian Institute, University College London (UCL), UK
\textsuperscript{c} Department of Earth Sciences, University College London (UCL), UK
\textsuperscript{d} Institute for Global Health, University College London (UCL), UK
\textsuperscript{e} Overseas Development Institute (ODI), London, UK
\textsuperscript{f} Department of Lifelong Learning, University of Jammu, India
\textsuperscript{g} Institute of Energy Research and Training, University of Jammu, India
\textsuperscript{h} Institute of Sociology, University of Jammu, India
\textsuperscript{i} Department of Geology, University of Jammu, India
\textsuperscript{c} Centre for Archaeology and Historical Studies, Royal University of Bhutan, Bhutan

\section*{Abstract}

This study aims to understand community risk perception to environmental hazards in a border conflict zone context in high-mountain areas. Participatory rural appraisal (PRA) tools were applied by the social science team. The results were validated with a hazard map prepared by a separate team comprised of geologists. Turtuk, the northernmost village in Ladakh, India located near the line of control with Pakistan was undertaken as a case study. Turtuk represents a high mountain indigenous rural community which has experienced several catastrophic disasters (flash flooding and landslides in 2010, 2014, and 2015) and territorial armed conflicts (wars in 1971 and 1999 with Pakistan) in recent times. The villagers were able to identify various environmental hazards and associated risk zones through participatory timeline diagram, and hazard and dream mapping exercises. The PRA maps matched the geological hazard map of Turtuk, demonstrating that community people...
EEFIT Mission in Ecuador

The 16 April 2016 Mw 7.8 Earthquake in Ecuador

Funded by the Earthquake Engineering Field Investigation Team (EEFIT), UK.

At least 700 people were killed.
Notable Works

Fael Khair School - cum Cyclone Shelters Program in Coastal Bangladesh – IMC Worldwide Ltd

Locational suitability analysis of Cyclone Shelters
Drought – Naogaon
Drought - Naogaon
Indigenous people’s responses to drought in northwest Bangladesh

Bayes Ahmed a, Ilan Kelman a, b, c, d, Md. Kamruzzaman d, Hossain Mohiuddin d, e, Md. Mostafizur Rahman d, Anutosh Das d, Maureen Fordham a, Mohammad Shamsudduha a

Abstract

Bangladesh is highly disaster-prone, with drought being a major hazard which significantly impacts water, food, health, livelihoods, and migration. In seeking to reduce drought vulnerabilities and impacts while improving responses, existing literature pays limited attention to community-level views and actions. This paper aims to contribute to filling in this gap by examining how an indigenous group, the Santal in Bangladesh’s northwest, responds to drought through local strategies related to water, food, and migration which in turn impact health and livelihoods. A combination of quantitative data through a household survey and qualitative data through participatory rural appraisal is used. The results suggest that the Santal...
Future Research Collaboration

- Global Challenges Research Fund (GCRF) - UK Research and Innovation (UKRI)
  https://www.ukri.org/research/global-challenges-research-fund/

- Horizon 20-20; Erasmus+
Thank you for your time & attention!

Email: bayes.ahmed@ucl.ac.uk