

Dr Md. Sarwar Hossain Sohel

Postdoctoral researcher (Marie Skłodowska-Curie fellow)

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Date of birth & Nationality 01 January 1986, Bangladesh

Education

PhD, Geography and Environment, University of Southampton 2012-2016.

- PhD project: Safe Operating Spaces for Development and Ecosystem Services in Bangladesh.
- System dynamic modelling, long-term trends, social-ecological system, ecosystem services, development goals (MDGs, SDGs) and trends of human wellbeing.
- Written 9 peer review journal articles and 6 book chapters

Visiting Student, University of Bergen, Norway. System dynamic modelling (April-May, 2014)

Post Graduate Taught Visiting Student, Physical Geography Department, Southampton University, UK (May-July, 2012)

MSc in Environmental Sciences. Wageningen University and Research center, The Netherlands 2010-2012.

Major in Environmental System Analysis.

- Dissertation Title: Integrating Ecosystem services and Climate Change Responses in Coastal Wetlands Development Plans in Bangladesh
- Dissertation includes disaster and vulnerability assessment, climate projection, adaptation and cost of adaptation.

Bachelor of Science (BSc) in Environmental Science (awarded 2009)

Khulna University, Bangladesh.

- Dissertation Title: Exploring Evidences of Climate Change in the southwest Bangladesh.
- CGPA 3.52 (67%) out of 4.

Short Course and Training

- Bayesian methods to fit statistical models in environmental science, University of Strathclyde - 22nd to 26th Feb 201
- Structural equation modelling, Southampton Statistical Sciences Research Institute, University of Southampton, UK June 2014.
- Analysis of Complex Survey Data - Social Statistics and Demography, University of Southampton, UK Jan 2014
- Time Series Analysis, Social Statistics and Demography, University of Southampton, UK, 4 days Short course, Oct 2013
- Regression Modelling Social Statistics and Demography, University of Southampton, UK, 3 days Short course, Oct 2013
- Summer School on Climate modelling. University of Oxford. 8-20th Sept 2013
- Agent Based Modelling Introduction, University of Oxford – 1st Nov 2012
- Agent Based Modelling Advanced, University of Oxford – 21st Nov 2012
- Bridging Geographic Information Science (GIS), Landscape Ecology (LE), and Remote Sensing (RS) for landscap analysis and landscape planning and is hosted by Salzburg University's Centre for Geoinformatics (Z_GIS) 27t June 2011- 8th July, 2011.
- Adaptation to Climate Change: An essential part of the Climate Change Policy. Hosted by Basque Centre fo Climate Change and University of the Basque Country, Spain. 19th July-22nd July, 2011.

- International Short Course On Community Based Climate Change Adaptation. Organized by International Centr for Climate Change and Development (ICCCAD), International institute for Environment and Development (IIED) Bangladesh Centre for Advanced Studies (BCAS), OXFAM GB, and Independent University (IUB) and supported b DFID

Honor

1. **Best paper award** ‘International conference on sustainable development 2016’ Dhaka, Bangladesh. Center for Sustainable Development (CSD) at the University of Liberal Arts Bangladesh (ULAB).
2. Selected as one of the **best 200 authors** in International Essay Competition 2009. Organized by World Bank. Topics of the essay Youth Tape: An Approach in Pursuing the Solution of Climate Change. Certificate Awarded by Norwegian Ministry of Defense, Norwegian Ministry of Finance and World Bank.
3. Honored of the prize of Essay Competition Organized by **Bangladesh Parliament Association and Commonwealth Parliament Association** Bangladesh By The Year 2003 on the occasion of Commonwealth Day Topics of Essay “ Partners in Development”.

Research Interest

Major: Social-ecological systems, System dynamics approach, Boundaries for sustainable development, tipping point, Safe and just operating space, Ecosystem Services and human wellbeing, Climate Change and disaster management, Water resource management, Complexity science and integrated ecosystem management, Risk and Resilience.

Geographical focus: Kenya, Bangladesh, Switzerland, Australia, and Poland

Skills relevant to research interest

Time series analysis, Statistical modelling, System dynamic modelling, GIS and household income and expenditure surveys, survey analysis. Agent based modelling, Bayesian modelling, Climate modelling

Teaching

Institute of Geography, University of Bern (2017 to now)

- System dynamics modelling of social-ecological systems
- Geodata analysis and modelling (Guest Lecture, System dynamics modelling)
- Challenges in geography

Geography and Environment, University of Southampton 2013-2016.

- GEOG2032 Global Climate Change: Science, Impacts and Policy (Guest lecture)
- GEOG1010 Geographical, Quantitative and Field Skills (Teaching Assistant)
- GEOG1011 Dangerous world (Guest lecture)

Training on teaching

Introduction to Teaching Skills for PGs - Part 1, University of Southampton

Introduction to Teaching Skills for PGs - Part 2, University of Southampton

Questionmark Perception

PhD Co-supervision

1. Soil carbon management and Social-ecological systems 2018-2020
2. River restoration in ecosystem services perspective, Jagiellonian University, Poland 2019-2021
3. System dynamics modelling for agro-ecosystem functioning and services (Visiting Ph.D. student from Stellenbosch University, South Africa) 2019
4. Household food security in Kenya, University of Bern 2019-2020.

Organization of conference, workshop, conference session

1. International workshop on Modelling Risk and Resilience in Human and Natural Systems, University of Bern, Switzerland 2019.
 - Lead organizer
 - Fund raises PI
2. MD Sarwar Hossain and Chinwe Ifejika Speranza. An introduction to system dynamics for understanding the sustainability challenges of land system transformations. 4th Open Science meeting: Transforming Land Systems for People and Nature, April 24-26th Bern Switzerland
3. Chinwe Ifejika Speranza, Sébastien Boillat, MD Sarwar Hossain Sohel. Sustainable social-ecological systems: from local to global challenges. Swiss geoscience Meeting, Bern 2018
 - Session co-organizer and chair of the one session
4. An International early career researchers conference on Biodiversity, Ecosystem Services and Sustainability, University of Southampton UK 2013
 - Fund raiser, organization, scientific committee, moderation of one session

Publications

Journal

In review:

- **Hossain MS**, Dearing JA, Ramirez J, Szabo S, Eigenbrod F, Johnson FA, Ifejika Speranza C (In Review) Participatory modelling for conceptualizing the social-ecological system dynamics in the Bangladesh delta. *Regional Environmental Change*
- **Hossain MS**, and Ifejika Speranza C (In Review) Challenges and opportunities for operationalizing the safe and just operating space concept at regional scale. *Sustainability Science*.
- **Hossain MS**, Ramirez J, Tina H; Ifejika Speranza C, Romppainen-Martius O, Mayer H, Keiler M (In review) A coupled human and landscape conceptual model of risk and resilience in Alpine mountain communities. *Science of the Total Environment*.
- **Hossain MS**, Gain A, Rogers KG (On going) Sustainable Coastal Social-ecological Systems. Special Issue. *International Journal of Sustainable Development and World Ecology*

Manuscript in progress:

- Tonderai MC, **Hossain MS** et al., Exploring safe and just operating space for wheat agroecosystems in the Western Cape South Africa. Target journal (*Environmental research letter*)
- Gain A, **Hossain MS** et al., Social-ecological system approaches and methods for water management. Target journal (*Environmental research letter*)
- Gain A, **Hossain MS** et al., Exploring contributions of SES approaches in tackling water-related risks for achieving SDGs. Target journal (*Nature Sustainability*)
- Amin MN, **Hossain MS** et al., systematic review of soil carbon management and the need for social-ecological systems framework in Australian agriculture. Target journal (*Ecology and Society*)

Published

1. Szabo A, **Hossain MS** and 8 authors (2018) Accelerating Progress Toward the Zero Hunger Goal in Cross-Boundary Climate Change Hotspots. *Environment Science and Policy for Sustainable Development*. DOI:10.1080/00139157.2018.1449530
2. Whitehead, P, 8 authors, and **Hossain MS** (2018) Restoring water quality in the polluted Turag-Tongi-Balu river system, Dhaka: Modelling nutrient and total coliform intervention strategies. *Science of The Total Environment*
3. **Hossain MS** and 14 authors (2017). Identifying future research directions for biodiversity, ecosystem services and sustainability: perspectives from early-career researchers. *International Journal of Sustainable Development & World Ecology*, S. 1-13. Taylor & Francis <http://dx.doi.org/10.1080/13504509.2017.1361480>
4. **Hossain MS**, Dearing JA, Eigenbrod F, Johnson FA (2017) Operationalizing safe operating space for regional social-ecological systems. *Science of The Total Environment* <http://dx.doi.org/10.1016/j.scitotenv.2017.01.095>
5. **Hossain MS**, Eigenbrod F, Johnson FA, Dearing JA (2016) Unravelling the interrelationships between ecosystem services and human wellbeing in the Bangladesh delta. *Int. J. Sustain. Dev. World Ecol.* <http://dx.doi.org/10.1080/13504509.2016.1182087>
6. Barbosa CCA, Dearing J, Szabo S, **Hossain MS**, Binh NT, Nhan DK, Matthews Z (2016) Evolutionary social and bio geophysical changes in the Amazon, Ganges-Brahmaputra-Meghna and Mekong deltas. 2016. *Journal on Sustainability Science*. DOI:10.1007/s11625-016-0371-7
7. **Hossain MS**, Dearing JA, Eigenbrod F, Johnson FA (2016) Recent trends of human wellbeing in the Bangladesh delta. *Environ. Dev.* <http://dx.doi.org/10.1016/j.envdev.2015.09.008>
8. Speera JH, Bräuningb A, Pourtahmasid QZKP, Gairee NP, Dawadig B, Ranae P, Dhakalj YR, Acharyag RH, Adhikarig DL, Adhikarih S, Aryali PC, Bagaleg D, Baniyaj B, Bhandarif S, Dahale N, Dahali S, Ganbaatark N, Girie A, Gurungl DB, Khandul Y, Maharjang B, Maharjang R, Malikm RA, Nathn CD, Nepalg B, Ngomao J, Pantf R, Pathakp ML, Paudelg H, Sharmai B, **Hossain MS**, Soronzonbold BS, Swer T, Thapaf I, Tiwaris A (2016) Pinus roxburghii stand dynamics at a heavily impacted site in Nepal: Research through an educational fieldweek. *Dendrochronologia*. DOI:10.1016/j.dendro.2016.01.005
9. Szabo A, **Hossain MS**, Matthews Z, Ahmed S, Lazar AN, Adger WN, Ahmad S (2015) Soil salinity, household wealth and food insecurity in tropical deltas: evidence from south-west coast of Bangladesh. *Sustainability Science* DOI: 10.1007/s11625-015-0337-1
10. Szabo SM, Renaud FG, **Hossain MS**, Sebesvári Z, Matthews Z, Foufoula-Georgiou E, Nicholls RJ (2015) Sustainable Development Goals Offer New Opportunities for Tropical Delta Regions. *Environment Science and Policy for Sustainable Development*. 57(4):16-23. DOI:10.1080/00139157.2015.1048142
11. **Hossain MS**, Dearing JA, Rahman MM, Salehin M (2015) Recent changes in ecosystem services and human wellbeing in the coastal zone. *Reg. Environ. Chang.* <http://dx.doi.org/10.1007/s10113-014-0748-z>
12. Dearing JA, Wang R, Zhang K, Dyke JG, Haberl H, **Hossain MS**, Langdon PG, Lenton TM, Raworth K, Brown S, Carstensen J, Cole MJ, Cornell SE, Dawson TP, Doncaster CP, Eigenbrod F, Flörken M, Jeffers E, Mackay AS, Nykvist B, Poppy GM (2014) Safe and just operating spaces for regional social-ecological system. *Glob Environ Change* 28:227–238. doi:10.1016/j.gloenvcha.2014.06.012
13. **Hossain MS**, Roy K, Datta D (2014) Spatial and temporal rainfall variability of rainfall over the south west coast of Bangladesh. *Climate* 2(2):28–46. doi:10.3390/cli2020028
14. **Hossain MS**, Hein L, Rip F, Dearing J (2013) Integrating ecosystem services and climate change responses in coastal wetlands developments plans for Bangladesh. *Mitig Adapt Strat Glob Change*. doi:10.1007/s11027-013- 9489-4
15. **Hossain MS** and Roy K (2011) Community Based Risk Assessment and Adaptation to Climate Change in the Coastal Wetlands of Bangladesh. *International Journal on Bangladesh Environment* 2(2): 96-105.

Book Chapter

16. Zhang, W., Gowdy, J., Bassi, A.M., Santamaria, M., DeClerck, F., Adegboyega, A., Andersson, G.K.S., Augustyn, A.M., Bawden, R., Bell, A., Darknhofer, I., Dearing, J., Dyke, J., Failler, P., Galetto, L., Hernández, C.C., Johnson, P., Jones, S.K., Kleppel, G., Komarek, A.M., Latawiec, A., Mateus, R., McVittie, A., Ortega, E., Phelps, D., Ringler, C., Sanga, K.K., Schaafsma, M., Scherr, S., **Sohel, Md S.H.**, Thorn, J.P.R., Tyack, N., Vaessen, T., Viglizzo, E., Walker, D., Willemsen, L. and Wood, S.L.R. (2018) Systems thinking: an approach for understanding 'eco-agri-food systems'. In, *The Economics of Ecosystems and Biodiversity (TEEB): TEEB for Agriculture & Food: Scientific and Economic Foundations*. Geneva.
17. **Hossain MS**, Dearing JA (2018) Recent Trends in Ecosystem Services in Coastal Bangladesh. In: *Ecosystem Services for Well-Being in Deltas* (pp. 93-114). Cham: Springer Nature 10.1007/978-3-319-71093-8_5
18. **Hossain MS** and Sazbo S (2017) Understanding the socio-ecological system of wetlands. In: Prusty BA, Chandra R, Azeez PA (ed.) *Wetlands Science: Perspective from South Asia*. Springer nature. DOI 10.1007/978-81-322-3715-0_15
19. **Hossain MS**, Kabir A, Nargis P (2017) Climate Change impacts and adaptation in wetlands. In: Prusty BA, Chandra R, Azeez PA (ed.) *Wetlands Science: Perspective from South Asia*. Springer nature. DOI 10.1007/978-81-322-3715-0_15
20. Willcock S, **Hossain MS**, Poppy G (2016) Managing complex systems to enhance sustainability. In: Solan M and Whiteley N (ed.) *Stressors in the marine environment: physiological and ecological responses and societal implications*. Oxford University Press.
21. **Hossain MS** (2010) Climate Error: Misconceiving the Development Issue (A Hardline View of the Water Resource Management Project of ADB in Bangladesh). NGO Forum on ADB, Manila, Philippine
22. **Hossain MS**, Roy K, Hauque M and Khan M (2010) Climate Change and Development: A Research on Mainstreaming of Climate Change in National Policy Development using Environmental Impact Assessment (EIA) in Water Resource Management at Narail, Bangladesh. Ulashi Sreejony Sangha (USS) and NGO Forum On ADB.
23. **Hossain MS**, **Roy K** (2010) Wetland and Climate Change Adaptation. 2010. Ulashi Sreejony Sangha (USS), Jessore, Bangladesh and Action Aid Bangladesh. ISBN 978-984-33-1676-9.

Working paper

24. **Hossain MS**, Dearing JA, Johnson FA, Eigenbrod F (In press) Participatory modelling as the basis for conceptual system dynamic modelling of social-ecological system in Bangladesh delta. South Asian Network for Development and Environmental Economics (SANDEE).
25. **Hossain MS**, Dearing JA (2013) Recent trends of ecosystem services and human well-being in the Bangladesh coastal zone. *Ecosystem Services and Poverty Alleviation (ESPA) Deltas Fast Track Report 3*. ESPA delta.

Conference

Hossain MS, Roy K (2010) Community Based Risk Assessment and Adaptation to Climate Change in the Coastal Wetlands of Bangladesh: A Case Study from Chenchuri Beel, Narail , Bangladesh. Proceedings of International Conference on Environmental Aspects of Bangladesh (ICEAB) 2010. ISBN: 978-984-33-1979-1. *www.binbd.com/benj/ICEAB/5.pdf*

Moni AH and **Hossain MS** (2010) Response of Environmental changes (Climate) in wetlands. 3rd International Conference on Bangladesh Environment 2010 by BEN and BAPA. Jan 3-4 2009. ISSN 978-984-33-0954-9. Page: 167-173.

Moni AH and **Hossain MS** (2010) Cyclones In relation to Climate Change: Strategy and Action Plan. International Conference on Bangladesh Environment 2010 by BEN and BAPA. Jan 3-4 2009. ISSN 978-984-33-0954-9. Page: 174-186.

Hossain MS (2010) Youth Tape: An Approach in pursuing the Solution Of Climate Change. International Conference on Bangladesh Environment 2010 by BEN and BAPA. Jan 3-4 2009. ISSN 978-984-33-0954-9. Page: 174-186. Page: 121-131.

Hossain MS, Roy K (2010) Rainfall Variability of the South Coast Bangladesh. International Conference on Bangladesh Environment 2010 by BEN and BAPA. Jan 3-4 2009. ISSN 978-984-33-0954-9. Page: 174-186. Page: 106-120.

Reviewer

Project

BioTip project of German Federal Ministry of Education and Research

The German Federal Ministry of Education and Research (BMBF) aims to support Research and Development (R&D) projects dealing with "Tipping points, dynamics and interactions of social and ecological systems (BioTip)". Funding is provided through the BMBF framework programme "Research for Sustainable Development" (FONA3). The R&D projects are aimed to support the implementation of the German National Strategy on Biological Diversity.

Journal

Nature Sustainability, Environmental development, Sustainability, Sustainability Science, International journal on Environmental Management and Planning, Mitigation and Adaptation Strategies for Global Change, Regional Environmental Change, People and Nature, Science of the Total Environment, Remote Sensing Applications: Society and Environment, Land use Policy, Ecosystems and People, Journal of Labor and Society, International Journal of Sustainable Development & World Ecology

Conference and workshop presentation

- Assessment of the sustainability of complex social-ecological systems at different scales: methods, tools and approaches. September 26-27, 2018
- EcoSummit 2016 (Ecological Sustainability: Engineering Change), Montpellier, France 2016
- International conference on sustainable development-Dhaka, Bangladesh 2016
- IARU Sustainability Science Congress –Copenhagen, Denmark 2014
- ESPA Delta international Annual Meeting- University of Southampton June 2013
- Global South Forum, University of Southampton. Climate Change Adaptation in the Global South April 2013
- National Doughnut Workshops. Oxfam and University of Oxford. 2014.
- International Conference on Bangladesh Environment 2010 by BEN and BAPA

Research grant/ fellowships

PI- Modelling Risk and Resilience in Human and Natural Systems, Swiss National Science Foundation, 2019. **15000 USD**

PI- Exploring pathways for transformation to sustainability using the safe and just operating space concept at the regional level (SUccESS). European Commission, Marie Skłodowska-Curie Individual Fellowship Feb 2019-Jan 2021. **€180,000**

PI- Exploring pathways for transformation to sustainability using the safe and just operating space concept at the regional level (SUccESS). European Commission, Marie Skłodowska-Curie Individual Fellowship Feb 2019-Jan 2021. **€180,000**

Co-PI- Social-ecological systems modelling and Sustainable Land Management. Sustainable Land Management Unit, University of Bern. **150,000 USD**

PI- Participatory modelling for conceptual system dynamic model of social-ecological system in Bangladesh delta. South Asian Network for Development and Environmental Economics (SANDEE)- March – October 2015. Grant **~12, 000 USD**

Safe Operating Space for Development and Ecosystem Services in Bangladesh. Interdisciplinary PhD Studentship by Nation Environmental Research Council, Economics, Social Research Council, UK, and University of Southampton. 2012-2015. Grant **~150,000 USD**

Netherlands Fellowship program (NFP). Dutch ministry of foreign affairs, The Netherlands. Grant **~60,000 USD**

Co-PI- Mainstreaming of Climate Change in National Policy Development using Environmental Impact Assessment (EIA) in Water Resource Management at Narail, Bangladesh. NGO Forum on ADB. Grant **~5,000 USD**

Employment

Postdoctoral researcher (Marie Skłodowska-Curie fellow), Transformation to sustainability in Kenya. Institute of Geography, University of Bern, Switzerland

- Transformation to sustainability using the safe and just operating space concept in Kenya
- Conceptualization and modelling of risk and resilience in human-natural systems.
- System dynamic modelling and agent based modelling

Postdoctoral researcher (2017-2018), System dynamic modelling of social-ecological system. Institute of Geography, University of Bern, Switzerland

- Limits to sustainable development
- Changes in social-ecological system
- Decision support tool using system dynamic approach
- Sustainability challenges in Kenya, Nigeria and Switzerland

Postdoctoral researcher, 1st Oct 2016 –Jan 2017, University of Southampton, UK 'DELTAS:

- Catalyzing action towards sustainability of deltaic systems with an integrated modeling framework for risk assessment' CO-PI Professor John Dearing and Professor Zoë Matthews, Geography and Environment, University of Southampton
- Spatial-temporal changes of household level poverty at different agro-ecological zones of Bangladesh
- Household Income and Expenditure (HIES) Survey data analysis

Research assistant, May-Sept 2012, University of Southampton, UK

- ESPA delta (Assessing health, livelihoods, ecosystem services and poverty alleviation in populous deltas), CO-PI Professor John Dearing, Geography and Environment, University of Southampton
- Times series analysis of biophysical and social indicators

Research and Communication Coordinator June 01, 2009- June 24th 2010, USS

- **Area of Issues:** Supporting the climate vulnerable children, water resource management, disaster management and emergency response, and adaptation to environmental change for reducing the poverty and gender equality, natural resource and wetland management, public communication policy in development issues.
- **Responsibility:** Research and Advocacy, communication with different agencies nationally and internationally. Project development and campaign, project implementation.

Under This Responsibility:

1. *Lead researcher:* Mainstreaming of Climate Change in National Policy Development using Environmental Impact Assessment (EIA) in Water Resource Management at Narail, Bangladesh, funded by NGO Forum on ADB.
2. *Campaign Coordinator of the Project:* 'Facilitating the wetland Based Peoples Livelihood Security in Narail, Bangladesh' funded by Action aid Bangladesh.
3. *Campaign Assistant:* Campaign on Climate Justice on the wetlands of Bangladesh, funded by Oxfam GB. *Monitoring and Evaluation Officer:* Child Friendly Space (CFS) in a Cyclone Vulnerable Area, funded by UNICEF and Action aid, Bangladesh.
4. *Monitoring Officer:* Emergency response to the aftermath of cyclone aila, 2009, funded by UNICEF and Action aid.

Researcher June 11th, 2008-May 30th, 2009, Initiative for Right View(IRV)

- **Area of Issues:** Water resources management, access to and control over natural resources and Disaster Management.
- **Area of Responsibility:** Research and Advocacy, Project Proposal, concept note development., Organizing the workshop in local level

Computer literacy

- Professional statistical software packages like STATA, SPSS, Minitab, R, Conoco, Excelstat
- Geo Information System (Arc GIS 9.2, ERDAS Imagine, V- LATE, eCognition) , Global News, RAINs, GAINs) Complex system software like STELLA, Vensim, climate model MAGIC/SCENGEN, Netlogo,