

Women's role in adaptation to climate change in Bangladesh

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January 23, 2021

CERTIFICATE OF ORIGINAL AUTHORSHIP

I Momtaj Bintay Khalil declare that this thesis, is submitted in fulfilment of the requirements for the award of PhD, in the Institute for Sustainable Futures at the University of Technology Sydney.

I certify that this thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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Finally, I dedicate this thesis entirely to my children who I believe would face the world that we leave for them by acting on issues like climate change and sea level rise. I hope the knowledge created through this thesis is a small contribution to that mammoth task of creating a better world for future generations.

Dedication

To my children ***Aydin*** and ***Naeela***,
who had no choice but to endure a PhD student as their mother!

List of publications during candidature

Published articles/chapters

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2. Khalil, M. B., Jacobs, B. C., McKenna, K., & Kuruppu, N. (2020). Female contribution to grassroots innovation for climate change adaptation in Bangladesh. *Climate and Development*, 12(7), 664-676. DOI: 10.1080/17565529.2019.1676188
3. Khalil, M. B., Jacobs, B. C., & Kuruppu, N. (2016). Grassroots Technologies and Community Trust in Climate Change Adaptation: Learning from Coastal Settlements of Bangladesh. In: Leal Filho W. (eds), *Innovation in Climate Change Adaptation* (pp. 297-311). Springer International Publishing, London.

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Conference proceedings

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3. Khalil, M. B., Jacobs, B. C., McKenna, K., & Kuruppu, N. (2018). 'Female contribution to grassroots innovation for climate change adaptation in Bangladesh'. International Conference on Global Warming and Climate Change (GlobeWarm 2018). 4-5th October 2018. Bangkok, Thailand.
4. Khalil, M. B., Jacobs, B. C., Kuruppu, N. (2015). 'Grassroots technology and community trust in climate change adaptation: learning from coastal settlements of Bangladesh'. World Symposium on Climate Change Adaptation. (WSCCA, 2015). 5-6 September 2015. Manchester Metropolitan University, UK.
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Awards during candidature

1. 'Best student presentation award' and 'Sessions best presentation award'- earned from a conference presentation in International Conference on Global Warming and Climate Change (GlobeWarm 2018), Bangkok, Thailand
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Preface

My PhD has not been a comfortable journey. I have encountered many obstacles and challenges throughout the whole process. Coming from a different background, culture and language, are challenges not easily overcome. Each time I managed to handle a challenge, I realized how much I had learned.

First, in my research as I have worked with vulnerable people in the context of climate change, every time my encounters with the community members through the fieldwork or the data remind me that I came from a place called Khulna, which is a region of frequent sea-level rise. I have seen how every year we got into trouble with increasing water issues, even a bad patch of a week or so in the rainy season can disrupt our lives enough to feel the vulnerability we endure. My personal experience inspired me to take up challenging topics related to climate change as a thesis, including gender dimensions. In the coastal villages in Bangladesh, situations are much worse than my relatively privileged life; men and women are affected disproportionately over there by the effects of climate change, and they have learned and strengthened to deal with nature by birth. Their adaptive strategies are also different, especially women face challenges in various ways. My intimate encounters with climate marginalized people in Gabura, Bangladesh have given me the opportunity to reconsider the adaptation challenges faced by women in particular.

There were some other difficulties I encountered with the literature on local and indigenous knowledge, which shaped my research later significantly. I was introduced to the literature on indigenous local knowledge by my PhD supervisors, especially I

came to learn a lot about Indigenous communities in Bangladesh coastal context who survived by utilising their own traditional knowledge and technology. They recommended a lot of constructive literature about indigenous knowledge (e.g. Sillitoe, 1998; 2006; Warren and Cashman, 1988; Warren, 1991), which helped me understand the concepts. My interest in the concept of local knowledge has been further enhanced by my former co-supervisor Dr Natasha Kuruppu's research on the adaptation strategy of a small island community through the application of local knowledge. This concept of indigenous or local knowledge inspired me to think more about how the coastal communities of Bangladesh survive with their own local knowledge and grassroots technologies – I must acknowledge that these knowledges vary and differ across contexts. Later in the first phase of my PhD, one of my book chapters on 'grassroots technology based on local knowledge adaptation' was awarded the second position in an international conference in Manchester, London, which was a strong motivation to move forward.

I learned more by attending several seminars in Australia led by e.g., Dr Neil Adger and Dr Terry Cannon, working on Bangladeshi coastal context; and Dr Sandie Suchet-Pearson working on indigenous knowledge in the Australian context. This concept of local knowledge and social capital further shaped the adaptation of these climate vulnerable people after a disaster in the coastal context of Bangladesh. I also learned about these concepts from my different informal encounters with my countryman, Dr Rabiul Islam of Macquarie University, Australia. Together these different encounters and experiences strengthened me. Later my first journal paper from my PhD brought me the 'best paper award' and 'session best presenter award' in International

Conference on 'Global Warming and Climate Change' at Bangkok, it was really inspiring!

My field work started in January 2016 in the remote coastal areas of Bangladesh, which was challenging, because it was the hardest task for me as my three-month-old 'baby bump' was accompanying me in the fieldwork. This hardship was further exacerbated as during the fieldwork I also had to travel back and forth to Dhaka, for the conference presentation¹. Reaching the survey area of Gabura Union was not an easy task due to a lack of safe and reliable transport system. I had to take multiple modes of transportation, for example, I reached the remote coastal Union by boat, had bumpy motorbike rides to reach the different villages, and finally walked on the dirt road to reach my participants, while my 'inner angel' gave me the emotional endurance - all the experiences added extra value throughout the whole journey. I felt sorry for those rural women who I saw were pregnant and who face these kinds of challenges on an everyday basis – I could feel for them. At the same time, getting all the opportunities in life made me feel privileged. Eventually, after completing the data collection process, I arrived in Sydney when my baby bump was seven months old, yet all the memories, the feelings filled my heart with tears and joy and at the same time, I enjoyed the journey navigating all the challenges.

¹ Before reaching at the study area, I interviewed some academics and disaster experts, both in Khulna and Dhaka (including first week of February a conference attendance in Dhaka) who were involved working in a similar field in the coastal context of Bangladesh, that led me to think more deeply about the study context.

The adaptation experience from the climate-affected women, their contribution at the family level, living alone with minimal resources with children when the husband is absent, uncertainty of living in the coastal areas, even though having lost all livelihoods resources, living with their new hope is genuinely inspiring. Their generosity, positive attitude, warm receptions, as they patiently spent time with me and shared with me their horrific experiences of cyclone Aila, have inspired and enriched my research that explores the different ways they adapt after cyclones. These women inspired me to realize that they possess strong adaptive capacities, but their social-cultural norms simply at times hinder their adaptation, reduce their abilities. All the experiences from my fieldwork have shaped my research on gender dimensions based on climate change, these experiences fascinate me to think in more detail about the contributions of climate-vulnerable women that remain often unrecognized. Over the past decade, since cyclones Sidr, Aila, the latest most intense cyclones, Bulbul and Amphan, have devastated the lives and livelihoods in the coastal areas (especially women in my case). However, the adaptive experience of women to extreme climate events that I explored in my research could be an example for future cyclone adaptive solutions and its path.

Momtaz Bintay Khalil

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Acronyms and Glossary of Terms

Action Aid	International NGOs work against poverty and injustice
AGB	Administrative Geography of Bangladesh
BBS	Bangladesh Bureau of Statistics
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BGB	Border Guard Bangladesh
BRAC	Bangladesh Rural Advancement Committee
BDT	Bangladesh taka
Caritas Bangladesh	An international NGO working on humanitarian assistance and disaster management
CCA	Climate Change Adaptation
CBA	Community Based Adaptation
CBO	Community Based Organization
CIM	Climate Induced Migration
CREL	Climate-Resilient Ecosystems and Livelihoods
CNRS	Center for Natural Resource Studies
COP	Conference of Parties
CSA	Climate Smart Agriculture
DFID	Department for International Development
DAM	Dhaka Ahsania Mission
DPHE	Department of Public Health Engineering
DRR	Disaster Risk Reduction
ECCP	Environment & Climate Change Program
FGDs	Focus Group Discussions

FDMC	Friendship Disaster Management Committee
GOB	Government of Bangladesh
HH	Household Head
IPCC	Intergovernmental Panel on Climate Change
ICCCAD	International Centre for Climate Change and Development
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environment and Development
INGO	International Non-Governmental Organization
JCF	Jagroni Chakra Foundation
JJS	Jagrata Juba Shangha, a social environmental development organization
KII	Key Informant Interviews
KU	Khulna University
KUET	Khulna University of Engineering & Technology
LG	Local Government
LSP	Local Service Provider
LT	Local Trainer
MOEF	Ministry of Environment and Forest
MDG	Millennium Development Goals
NGOs	Non-Governmental Organizations
NGF	Nowabenki Gonomukhi Foundation
NRM	Natural Resource Management
Oxfam	An international NGO work on climate disaster management
PSF	Pond-Sand-Filter
PKSF	Palli Karma Sahayak Foundation

QDA	Qualitative Data Analysis
RU	Rajshahi University
RWHS	Rainwater Harvesting System
SSI	Semi Structured Interview
Susilon	A local NGO working for coastal resource management
UNFCCC	United Nations Framework Convention for Climate change
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organizations
UNICEF	United Nations International Children’s Emergency Fund
UNISDR	United Nations International Strategy for Disaster Reduction
UNO	Upazila Nirbahi Officer
UP	Union Parishad
UPC	Union Parishad Chairman
URP	Urban and Regional Planning
USAID	US agency for International Development
USD	United States dollar
Uttoron	A local NGO, work with costal local community
WASH	Water, Sanitation and Hygiene
WaterAid	An International NGO, focused on water, sanitation and hygiene
WEF	World Economic Forum
Winrock International	A nonprofit organization that works with people
WHO	World Health Organization
WVB	World Vision Bangladesh

Glossary of terms

Bazar (Market) An important marketplace where people regularly gather to buy or sell local products in the context of village. Male community members in particular gather every day in the *bazar* to purchase, smoke, play cards or take tea.

CREL (Climate Resilient Ecosystem Livelihoods) An important project of USAID in the coastal context of Bangladesh. The project worked to improve the livelihood and environment with men and women of resource dependent families in the coastal areas.

CNRS (Centre for Natural Resource Studies) An NGO working for the conservation of ecosystems and the promotion of community-based adaptation through the management of natural resources for the coastal settlements of Bangladesh.

District (first tier of administrative unit) Formed by local Government in Bangladesh. Bangladesh has 64 districts.

Division (First-level administrative seat in Bangladesh). Bangladesh has 8 divisions in total. Khulna is one of the eight division and 3rd largest city.

Gram (Village) A village/ *gram* is administratively a clustered community or the smallest social unit. Each village is designated as a ward. A union consists of nine villages.

Haat (A weekly local open-air market) In the rural context, *haat* is an important gathering place that is held once or twice a week.

Immobility (Not moving) Climate induced immobility is framed as ‘non-evacuation behaviour’ applicable to women in the coastal context of Bangladesh.

Kacca road (Muddy road) In the context of the village, most of the connecting roads are unpaved/ muddy roads which create problems for people during the rainy season.

Kheya Ghat (*Jetty*) A platform from where the boat puller receives people for crossing river.

Latrine (Known as pit latrines) Latrine distributed by Local Govt. or NGOs to ensure safe sanitation for poor coastal households in Bangladesh, manufactured with three concrete rings and a slab.

Matbar (The village informal local leader, called Morol or Matbor). Matbor plays an important role to solve social problems in village context.

Nakshi Kantha (Handmade sewing traditional products) Produced by rural women. BRAC is helping to empower the rural women by involving them in this production.

Parishad (Council) Formed by local Govt. Union Parishad chairman within the Upazila is considered as the member of the parishad

Para (Neighbourhood) An important relational fabric in a community in a village context, especially in women-to-women neighbourhood relationships.

Post-Aila (After cyclone Aila in 2009 is the period of 'post-Aila') Refers to the aftermath of Category 1 Cyclone 'Aila' that hit the South-western Bangladesh in May 2009.

PSF (Pond-sand-filter) Widely used as for the filtration of pond water as for alternative safe water sources, such as for cooking purposes in coastal context. **Pucca road** (paved roads of cement or brick) In coastal village context paved roads are uncommon.

Salish (Traditional mechanism for village dispute settlement, less formal than the village court)

Samaj (society) Religious community which helps to structure local village societal organization.

Sari (Traditional long cloth) An everyday cloth for South Asian women in rural context, a cultural identity.

Soil salinity (Rising sea levels cause soil salinity) In coastal context of Bangladesh soil salinity has had a major impact on the agricultural sector and drinking water sources. Climate change poses a major soil salinization risk.

Salt-tolerant vegetables (Salinity resistant crops) Due to the high level of soil salinity in the coastal areas, it is unsuitable to produce normal traditional crops, that transform to grow salt tolerant crops, such as, eggplant, bottle gourd, chilli, squash.

Union Parishad/ Union council (Called as Union or rural council) Formed under the local Government, a smallest rural administrative unit. A union council consisting of a chairman and twelve members. Three member seats are reserved for women. There are 4554 unions in Bangladesh. Each Union has nine wards.

Union Members (An important role of a union in village context). Union Parishad consists of twelve members among them three seats are reserved for women.

Upazila (Sub-district) Second lowest tier of administrative unit of local Government in Bangladesh. Bangladesh has 492 *upazilas*. Upazilas are further divided into union *parishads* (UP).

Uthan (Courtyards). In rural context, the domestic outdoor space or a shared courtyard space in between the houses is called *uthan*, where the women spend important day-time activities and the domestic chores.

Ward (Electoral subdivision). Usually, a village is designated as a Ward. Each Union consists of nine wards.

Abstract

Women in Bangladesh are highly exposed to the effects of climate change. Bangladesh is a cyclone and flood prone area; where coastal women are deprived of access to resources (e.g. information, knowledge and education). Women's vulnerabilities are further exacerbated by socio-cultural and religious factors that lead to a lack of communication with outside actors. The contribution of women to climate change adaptation has been largely ignored across all levels of society, by members within the family, community, policymakers and beyond; thus, women's capacity for adaptation is heavily constrained.

This thesis reports a mixed method study in the coastal village of Gabura Union under Shyamnagar *upazila* of Satkhira district in Bangladesh; an area that is at risk of frequent severe cyclones. For example, Aila in 2009 and Sidr in 2007 have ongoing impacts on communities, such as soil salinity because of prolonged period of seawater inundation. This study explores women's adaptation to climate change through analysis of empirical data under several theoretical threads: the role of local knowledge, the contribution of types of social capital and the significance of place attachment in understanding of women's place-based adaptation.

The thesis firstly highlights the ways women develop livelihood capacities by engaging with aid agencies and developing innovative adaptation strategies based on their local knowledge and social relationships, in the absence of their male community members. Secondly, among the three most commonly identified forms of social capital (e.g. bonding, bridging and linking); bonding capitals are found to be loosened after a major

catastrophe due to male community members' out migration. Over time, developing linking social capital with NGOs helps strengthen bridging social capitals with other community women through development of novel livelihood responses. A third area of the thesis highlights the role of place and how women's attachment to place helped enhance their adaptation responses by making use of a range of livelihood capitals.

Overall, the findings support calls to reconsider the role of women in adaptation to climate change and provide recommendations for considering the intersection of gender and climate change adaptation. In this regard, the thesis establishes the importance of strengthening and broadening linking social capital to develop more gender inclusive adaptation responses (e.g. to ensure women and men can participate in climate change programs equally) to develop tailored adaptation action in a post-disaster context.

Keywords: Bangladesh, women, local knowledge, social capital, place attachment, place-based adaptation and climate change