

Climate, Agriculture and Migration: A Critical Review of Dynamic Livelihood Changes in the Nepali Tarai

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Thesis submitted for the degree of Doctor of Philosophy
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2017

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Abstract

Climate change is altering human relationships with their places in complex ways in Nepal. This research examines the responses to challenges brought about by environmental change at two municipalities, Damak and Dhangadhi—in the southern plains of Nepal known as the Tarai. The dissertation presents narratives on the social and ecological history of the Tarai, portraying the current environment as a product that has been shaped in part by in-migrants, and the associated entrenched social inequalities. The understanding of the complex dynamic relationships between climate change, agriculture and migration leads to a critical discussion of opportunities for planned adaptation measures to increase resilience of the dynamic socio-ecological system.

This research utilizes both quantitative and qualitative primary data, collected through a questionnaire survey of 298 households and 23 in-depth interviews to analyse trends in livelihoods strategies in the Tarai. The questionnaire sought details on basic household assets, livelihood practices, reliance on natural resources, perception of changing climatic patterns and remittances for migrant households. The socio-economic backgrounds of individuals, households, their motivations for migration and the impacts on households are analysed within a socio-ecological analytical framework, using the primary data. Meteorological data from the past three decades was used to generate climate indices to quantify climate variability and change. The insights from the climate data analysis were compared with the primary data generated both from the questionnaire survey and narratives gathered from interviews, to develop an understanding of the local socio-ecological interface.

The study highlights the importance of the process by which households minimize risks by investing in multiple off-farm livelihood options, including supporting family members to become migrant workers in the hope of receiving stable remittances. The increased chances of extreme precipitation pose additional challenges to the sensitive agricultural practices. Examination of households' demographic details suggests a prevailing low level of human capital with limited prospects for in-situ off-farm employment, pressuring families to exploit livelihood opportunities from migration. Migrants from higher socio-economic backgrounds are opting for new international destinations, particularly in the Gulf Countries and Malaysia, while those less fortunate rely on long established destinations in India and Nepal. This change signifies that Tarai migrants have become essential transnational actors in a globalised world, and highlights the connectedness of the Tarai rural communities to the rest of the world. The results suggest that the dynamics of recent in-migration into the Tarai has led to innovative responses to new risks, but those responses are highly complex, involving multiple movements of people and capital to exploit a new international labour environment.

The thesis contributes to existing knowledge on interactions between agricultural systems, environmental change and human mobility; and especially on contemporary policy discussions on the inclusion of circular migration as an adaptation policy to mitigate the impact on future climate change on primary resource dependent communities. While enabling Tarai residents to better adapt to change and avoid poverty traps in the short-term, ex-situ measures disrupt the complex local socio-ecosystems at the household level.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968. I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

I acknowledge the support I have received for my research through the provision of an Australian Government Research Training Program Scholarship.

Signed: _____

Date: _____

Acknowledgements

Over the course of conducting this research, I have received invaluable help from many. I would like to take this opportunity to express my gratitude and indebtedness to those individuals and institutions for their role in shaping this thesis in this final form.

First and foremost, I would like to thank my primary supervisor Dr. Douglas Bardsley for his continuous support and encouragement. I am also grateful to my co-supervisor Dr. Dianne Rudd for valuable advice, and support. I would also like to acknowledge the support from co-supervisor, late Prof. Graeme Hugo for invaluable help in shaping the research themes, particularly, the guidance on thesis reorganization to encompass the full extent of field-work findings. Although he could not see the later stages of this work, the current form of this work would not be possible had it not been for his inputs.

This endeavour would not have been complete had it not been for the willingness of the kind people of Damak and Dhangadhi municipalities who shared their stories and participated in this research; for the guidance and expert input from many intellectuals; and for material and emotional support provided by the university, family, friends and well-wishers.

This PhD research was funded through the Adelaide Scholarships International (ASI), with additional support for field-work and conference travel support from the Department of Geography, Environment and Population (GEP) at the University of Adelaide (UoA). Partial travel funding for attending a 2015 workshop on climate change and human mobility was provided by Fenner School of Environment and Society, Australian National University, Canberra.

I would also like to thank the following people for being part of this research in many different ways: Krishna Chaudhary and Sujan Ranjitkar, my field assistants for supporting me during field data collection; Umesh Dhimal, my long-time friend for helping plan for the field stay in Damak, Tejpal Dhimal and family for hosting me in their house during my reconnaissance survey, Laxmi Niraula for introducing me to local contacts, and for lending me his motorbike, Neeraj Dangol, for help in obtaining climate data. Kanchan Ojha, for helping me connect with development professionals in Dhangadhi. Thanks also to my GEP mates, Alisi Holani, George Tan, Mensah Owusu, Panwad Wongthong, Rishikesh Pandey, and others. Also, I am grateful to the colleagues met at conferences and workshops who gave feedback on my research and help refine my thesis. Lastly, sincere thanks to my dad, my mum, my brother and my sister for their love, encouragement and the belief that I will get through this task amidst challenges.

Abbreviations

AUD	Australian Dollars
BS	Bikram Sambat
CBS	Central Bureau of Statistics
CCI	Commission for Climatology
CDO	Chief District Officer
CLIVAR	Climate Variability and Predictability
CVFS	Chitwan Valley Family Study
DHM	Department of Hydrology and Meteorology
DoS	Department of Survey
EPS	Employment Permit System
ETCCDI	Expert Team on Climate Change Detection and Indices
FDI	Foreign Direct Investment
FM	Frequency Modulation
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GIS	Geographic Information System
GoN	Government of Nepal
HDI	Human Development Index
IB	Insurance Board
IOM	Institute of Migration
IPCC	Intergovernmental Panel on Climate Change
LPG	Liquefied petroleum gas
masl	meters above sea level
MK	Mann-Kendall
NAPA	National Adaptation Plan of Actions
NELM	new economics of labour migration
NGO	Non-Government Organization
NLSS	Nepal Living Standard Survey
NPR	Nepalese Rupees
NRB	Nepal Rastra Bank
NVivo	NVivo qualitative data analysis Software developed by QSR International Pty Ltd.
ppb	parts per billion
PPP	Purchasing Power Parity
SI units	International System of units
SLC	School Leaving Certificate
UAE	United Arab Emirates
UN	United Nations
UNDP	United Nations Development Project
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UofA	The University of Adelaide
USA	United States of America
USD	United States Dollars
VDC	Village Development Committee
WECD	World Commission on Environment and Development
WMO	World Meteorological Organization

Description of local units used in the text

For currencies mentioned in the text, the United States Dollar (USD) equivalent of the amounts in Nepali Rupee (NPR) is given in parentheses with the conversion rate of USD1 equivalent to NPR100. The conversion rate is based on the prevailing rate during the fieldwork period (September 2013 to March 2014) as set by Nepal Rastra Bank (NRB) rounded to a whole number figure for simplicity. During the same time, 1 Australian Dollars (AUD) was valued at around NPR93 according to the official rates set by NRB.

In addition to the Gregorian calendar, Nepal follows the Bikram Sambat (BS) calendar system with the new year commencing around mid-April. BS system is the official system and most commonly used. Typically, the BS calendar is ahead from the Gregorian calendar by fifty-seven years but the exact conversion of days from among the BS and Gregorian system requires complex calculations. Year 2016 for instance was year 2072-2073 BS.

Land area is typically measured in local units in Nepal. In the Tarai, land measurements are done in Bigha, Kattha and Dhur units (1 Bigha = Kattha, 1 Kattha = Dhur) and in Hill or Mountain region, in Ropani, Ana, Paisa and Dam units (1 Ropani = 16 Ana, 1 Ana = 16 Paisa, 1 Paisa = 4 Dam). In International System of Units (SI units) terms, 1 Bigha and 1 Ropani are equivalent to 6,772.632 sq. m. and 508.737 sq. m. respectively. In this text, any mention of land area in local terms are also described in SI accepted unit of hectare (ha), which represents an area of 10,000 sq. m.