



Assessing the Climate Change Environmental Degradation and Migration Nexus in South Asia



International Organization for Migration (IOM)
The UN Migration Agency



IOM Development Fund
DEVELOPING CAPACITIES IN MIGRATION MANAGEMENT

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Finally, the team is extremely grateful to IOM Development Fund for the financial support to conduct the study.



Foreword

Relationship between climate change and migration is complex. The interacting social, economic, cultural as well as environmental factors on human security is incompletely considered to date. However, it is evident that environmental degradation due to climate change and corresponding impacts on socioeconomic systems are influencing migration of vulnerable people. Migration has proven to be a means of adaptation for those vulnerable to climatic changes, bringing positive impacts to the lives of people through sustained and diversified livelihoods. Therefore, a nexus among migration, environmental degradation and climate change could be assumed.

Bangladeshis are historically renowned for their strong adaptive capacity to confront adverse impacts of social, political and environmental events. They are familiar with the challenges imposed by floods, droughts and many other environmental threats. However, the growing irregularity and recurrence of climate extremes imposed by climate change is leaving no room for the vulnerable people to sustain within their own capacities but to migrate to a safer place such as urban areas. This phenomenon is common to other south Asian countries.

The study on “Assessing the Migration, Environmental Degradation and Climate Change nexus in South Asia” under the framework of the International Organization for Migration (IOM) is a timely and appropriate work in this context. The Report has identified a number of actions and proposed a regional strategy framework guided by empirical evidence. This could facilitate policymakers and practitioners of this region to address climate induced migration concerns.

I appreciate IOM for taking this initiative and extend my gratitude to everyone involved in preparing this Research Report.

I reaffirm the Ministry’s commitment to work towards durable solutions for climate induced migrants.

Dr Kamal Uddin Ahmed

Secretary

Ministry of Environment and Forests

Government of the People’s Republic of Bangladesh



Foreword

The impacts of climate change are of utmost concern to the Maldives. Even though we are amongst the least contributors to the cause of climate change, Maldives is at the forefront of its adverse impacts. For a long time, environmental factors have impacted on global migration flows, as people have historically left places with harsh or deteriorating conditions. Maldives is no exception, and environmental change remains one of the key drivers of population migration here as well. Coastal erosion, depletion of ground water lens, and damages due to extreme weather events are some of the recorded factors which have contributed to population migration historically in the Maldives. It is predicted that climate change will result in increased migration through different pathways, resulting in social and economic consequences.

It is therefore necessary to develop a robust knowledge base and empirical evidence to examine the complex relationship between migration, climate change and the environment. Although climate change related migration impacts have not yet been thoroughly studied in the Maldives, the Action Plan developed under the International Organization for Migration study will help in planning future endeavors in areas such as public education and resilience building of communities.

In this context, I extend my appreciation to the IOM for leading the regional study on “Assessing the Climate Change, Environmental Degradation and Migration nexus in South Asia”, undertaken in Nepal, Bangladesh, and Maldives. This study will significantly contribute to our knowledge on this issue.

I acknowledge with gratitude the invaluable effort made by the consultants to conduct the study and compilation of the Action Plan. Finally, I extend my sincere appreciation to the Project Advisory Committee members, government and public institutions for their direction, dedication and support throughout this study.

Abdullahi Majeed
Minister of State for Environment and Energy
Government of Republic of Maldives



Foreword

Nepal is considered to be among the most vulnerable countries to climate change and environmental degradation. Natural disasters, such as floods, landslides and glacial lake outburst floods affect migration trends in the country. The Koshi and Darchula floods are examples of the way in which environmental events impact on local populations. Migration of people from the Hill to Tarai region, due to water shortages, further confirms climate change and migration as relevant concerns for Nepal. These issues highlight the need to formulate a national policy on migration and climate change. Adaptation measures which address the challenges of environmental risks, should include migration, as movement in search of livelihoods and shelter, or towards safer places both internally and across borders, is persistent.

In an attempt to respond to the policy gap surrounding climate change and migration with evidence about the local impacts of these processes, the regional research study, “Assessing the Climate Change, Environmental Degradation and Migration Nexus in South Asia”, was carried out in Bangladesh, Maldives and Nepal to understand the key factors influencing migration and how people perceive the link between climate change, environmental degradation and migration in the three countries.

The research has revealed some interesting findings, including insights relating to how climate change affects agricultural productivity, and the consequential effects on livelihood options and incomes for local populations already vulnerable to poverty. The study also identifies how environmental processes force people to migrate for a better income and livelihood. We believe the research report is contextual, relevant and useful for all stakeholders, including policymakers, development partners, donors and practitioners. The National Plan of Action on Migration and Climate Change along with this research have developed strategies and activities to mitigate the associated vulnerabilities.

We would like to thank the International Organization for Migration (IOM) for undertaking this research which has strengthened the collaboration with the Ministry of Labour and Employment (MoLE) and the Ministry of Population and Environment (MoPE). We also express our sincere thanks to the researchers Mr. Sanjay Sharma, Mr Khem Shirish and Mr Deependra Nath Joshi, for carrying out this research and developing the National Plan of Action on Migration and Climate Change, as well as the entire team of IOM and the officials of both the Ministries, including the Joint Secretaries Mr Ram Prasad Lamsal and Mr Govinda Mani Bhurtel, who have contributed to this research.

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International Organization for Migration (IOM)
The UN Migration Agency

Foreword

The world today is witnessing an era of unprecedented human mobility with more than one billion people on the move. While well-managed migration has been recognized as an enabler of socio-economic development, forced migration due to poverty, conflict, climate change and disasters can lead to deterioration in development outcomes.

Among the drivers of migration, climate change and environmental degradation challenge communities by endangering their livelihoods, resources and well-being, triggering migration as a coping mechanism or displacement in cases where the movement is not voluntary.

For South Asia, the range of sudden and slow onset events like changing rainfall, rising sea-levels, coastal erosion, floods, salinity intrusion and droughts put communities at greater risk impacting their economic, health, food and security conditions. There is a need to develop a holistic mechanism to mitigate the negative effects of climate-induced hazards, reduce the number of people displaced as a consequence of these and enhance resilience of communities including by managing migration for adaptation.

As the leading intergovernmental migration agency, the International Organization for Migration (IOM) has been at the forefront of operational activities, research, policy and advocacy efforts, seeking to bring environmental migration to the heart of international, regional and national dialogues and policy frameworks. Given this backdrop, IOM implemented the regional project on “Assessing Climate Change and Environmental Degradation in South Asia” in Bangladesh, Maldives and Nepal.

This study aims to provide an overview of the nexus of climate change, environmental degradation and migration in all three countries. We hope that the proposed plans of action and regional strategy framework based on the empirical evidence contained in the study will provide a reference for the Government and other stakeholders at national and regional levels to strengthen interventions to address the challenges and leverage the opportunities associated with climate migration.

I express my sincere gratitude to the Government of Bangladesh for supporting IOM Dhaka, as the managing mission in implementing this project. We are also grateful to the Government of Nepal and Maldives for providing strong leadership essential for taking forward the project’s objectives.

I would like to reiterate IOM’s commitment to collaborating with stakeholders in implementing the action plan and the proposed regional strategy framework. IOM stands ready to support Government’s interventions to address migration, environment and climate change matters and assist migrants and vulnerable communities.

Finally, I would like to thank the researchers and the project teams in Bangladesh, Maldives, Nepal and Regional Office for Asia and Pacific for successfully carrying out the project activities.

Sarat Dash
Chief of Mission
IOM Bangladesh

CONTENTS

Acronyms and abbreviations	15
Glossary	17
Executive summary	18
1. Introduction	25
2. Overview of the climate change, environmental degradation and migration nexus	26
3. Climate change, environment and migration in South Asia	28
3.1 <i>Background</i>	28
3.2 <i>Existing policy directions and institutional arrangements on climate change, environmental degradation and migration aspects in South Asia</i>	28
4. Research framework and methodology	31
4.1 <i>Background, research questions and conceptual framework</i>	31
4.2 <i>Research plan</i>	35
4.3 <i>Limitations of the study</i>	40
5. The Bangladesh chapter – findings of the study	42
5.1 <i>Literature review on factors influencing migration in Bangladesh</i>	42
5.2 <i>Migration trends in Bangladesh</i>	48
5.3 <i>National policy and legal instruments related to climate change, environmental degradation and migration in Bangladesh</i>	49
5.4 <i>Institutional arrangements to address climate change and natural disasters, environment and migration</i>	51
5.5 <i>State of implementation of policy and legal instruments: gaps and the way forward to address the MECC nexus in Bangladesh</i>	53
5.6 <i>Results of the primary data collection–Bangladesh</i>	55
5.7 <i>Conclusion and recommendations</i>	91
6. The Maldives chapter – findings of the study	95
6.1 <i>Literature review on the climate change and environmental factors that affect Maldives</i>	96
6.2 <i>Migration trends in the Maldives</i>	104
6.3 <i>Displacement and planned relocation following the 2004 tsunami</i>	107
6.4 <i>Existing policy directions and institutional arrangements on climate change, environmental degradation and migration aspects</i>	108
6.5 <i>Results of the primary data collection–Maldives</i>	108
6.6 <i>Conclusion and recommendations</i>	117

7. The Nepal chapter – findings of the study	159
7.1 <i>Literature review</i>	160
7.2 <i>Environmental hazards, disasters and climate change</i>	161
7.3 <i>Forms and trends of migration</i>	166
7.4 <i>Literature on the migration, environment and climate change nexus in Nepal</i>	172
7.5 <i>Policy regime on climate change and migration</i>	173
7.6 <i>Results from the primary data collection–Nepal</i>	179
7.7 <i>Conclusion and recommendations</i>	205
8. Concluding analysis of the regional context	209
References	212
Annex 1 OVERALL RESEARCH PLAN	242
Annex 2 MODEL NATIONAL PLANS OF ACTION	243

List of Table

Table 1:	South Asia policy and strategy on climate change, disasters and their reflection of migration issues	29
Table 2:	Survey coverage and sample size in Bangladesh	37
Table 3:	Number of households included in household survey in Maldives	38
Table 4:	Origin and destination of displacement according to hazards	44
Table 5:	Summary of literature on hazards and their socioeconomic impact	45
Table 6:	Relevant policy and strategic documents in Bangladesh and their reflection of migration issues	50
Table 7:	The gender distribution in study districts by participation from each household	57
Table 8:	Education status of the respondents by study districts	55
Table 9:	Major sources of income by study district	59
Table 10:	Major sources of income by type of study households	60
Table 11:	Household assets in the study areas	63
Table 12:	Eco-zone specific vulnerability based on the responses of study households to different climate change and environmental concerns	75
Table 13:	Impacts on sectors in study locations	77
Table 14:	Households use of last remittance for various purposes by district	85
Table 15:	Implications of migration of specific household members on the members left behind	88
Table 16:	Anticipated impacts of migration on vulnerable family members	89
Table 17:	Number of requests sent to Ministry of fisheries and agriculture since 2012	98
Table 18:	Affected areas due to heavy rain and flooding from 1991	99
Table 19:	Natural Disasters in Maldives from 1900 to 2011	99
Table 20:	Institutional arrangements relating to MECC in Maldives	113
Table 21:	Household by size and composition	121
Table 22:	Impact of climate change and environmental hazards on households in Hanimadhoo as perceived by the households	137
Table 23:	Impact of climate change and environmental hazards on households in N. Holhudhoo as perceived by the households	138
Table 24:	Impact of climate change and environmental hazards on households in Male' as perceived by the households	140
Table 25:	Impact of climate change and environmental hazards on households in Lh. Naifaru as perceived by the households	141
Table 26:	Types of drinking water in the number of households	149

Table 27:	Populations differently affected by climate change	153
Table 28:	Priority ranking of sectors to climate change	161
Table 29:	Socioeconomic and demographic characteristics of Darchula	179
Table 30:	Climate change vulnerability ranking of Darchula	181
Table 31:	Monthly seasonal calendar of climate change proxies	182
Table 32:	VDC level disaster ranking	183
Table 33:	Population trend in the study VDCs	183
Table 34:	Absentee population from the study VDCs	184
Table 35:	Brief overview of the household characteristics	185
Table 36:	Marital status of the respondents by age and gender (in percentage)	187
Table 37:	Land size by history of migration	189
Table 38:	Primary occupation of the sampled household by their migration history	191

List of Figures

Figure 1:	A Three-Dimensional View of Environmental Migration Patterns	27
Figure 2:	Conceptual framework for climate change, environmental degradation and migration nexus in South Asia	33
Figure 3:	Conceptual framework for climate change and migration nexus in South Asia	34
Figure 4:	Assessing the evidence: Sudden-onset events, slow-onset processes	43
Figure 5:	Hazards and displacement relationship	43
Figure 6:	Percentage distribution of the respondents by age and gender	56
Figure 7:	Percentage distribution of the Primary occupation of the respondents	58
Figure 8:	Gender distribution of household members by age	58
Figure 9:	Average monthly income and expenditure of the study households by districts	60
Figure 10:	Monthly mean income and expenditure of migrant and non-migrant study households	61
Figure 11:	Average land owned by migrant and non-migrant households by district	61
Figure 12:	Percentage distribution of having a house on own land by district	62
Figure 13:	Percentage of households using own land for different purposes	62
Figure 14:	Percentage distribution on savings of the households among the study areas	64
Figure 15:	Percentage distribution of access to electricity and latrines by district	64

Figure 16: Percentage distribution of access to health services at Union level in study locations	65
Figure 17: Migration trends from the study households	66
Figure 18: Migration trends from the study households	67
Figure 19: Climate change related hazards that affect study locations according to respondents	73
Figure 20: Other environmental concerns that affect the study locations according to respondents	73
Figure 21: Major climate change and environmental hazards that contribute to migration decisions	79
Figure 22: Major non-climatic factors that also influence in migration decisions	81
Figure 23: Type of internal migration (n=160)	82
Figure 24: Reasons compelling migration from the study areas	83
Figure 25: Preferred destination for internal migration	83
Figure 26: Major factors that influence households to choose the destination	84
Figure 27: Who decides on migration in the study households (n=160)	85
Figure 28: Difference among migrant and non-migrant households in dealing with adverse climate change effects	90
Figure 29: How the study households deal with adverse effects of climate change	91
Figure 29a: Typical hydrology of the Maldives	103
Figure 30: Maldivians residing outside their island of birth	105
Figure 31: Lifetime migration streams to Male' 2006	106
Figure 32: Population by age group and sex	118
Figure 33: Relationship of the household head to the respondent	119
Figure 34: Marital status by locality	119
Figure 35: Education levels	120
Figure 36: Primary occupation of the respondents	120
Figure 37: Major source of income	122
Figure 38: Income status over the last 10 years	123
Figure 39: Number of income earners in the family	124
Figure 40: Household monthly income, in Maldivian Rufiya	124
Figure 41: Household monthly income 10 years ago (in MVR)	125
Figure 42: Household monthly income 5 years before (in MVR)	125
Figure 43: Household monthly income range, in Maldivian Rufiyaa	126
Figure 44: Household ownership	127

Figure 45: Household assets	127
Figure 46: Internal migration	128
Figure 47: International migration	130
Figure 48: Non-Climatic factors that influence migration	131
Figure 49: Non-climatic factors did not contribute to household decisions to migrate	131
Figure 50: Reasons for forced migration	133
Figure 51: Preferred destinations	133
Figure 52: Drivers influencing destination	134
Figure 53: Do you receive remittances?	134
Figure 54: Remittances received regularly	135
Figure 55: Ways of spending the remittances	135
Figure 56: Ways of spending the last remittances	136
Figure 57: Number of immigrants in the Maldives	136
Figure 58: Climate change and environmental degradation affecting migration/ displacement in the study sites according to the household survey	145
Figure 59: Sea-level change	151
Figure 60: Migration of male members and implications on females	153
Figure 61: Migration of female members and implications on males and the responses	154
Figure 62: Anticipated impacts of migration on vulnerable household members	154
Figure 63: International migrants in national censuses (number of people)	166
Figure 64: Labour migration trend (number of labour migrants by year of migration)	167
Figure 65: Top labour destinations for Nepali migrant workers (2008/2009-2014/2015)	168
Figure 66: International remittances received by Nepal	168
Figure 67: International remittances received by Nepal	169
Figure 68: Map of the study area	180
Figure 69: Gender of the respondents	185
Figure 70: Age of the respondents	186
Figure 71: Respondents' age by gender	186
Figure 72: Marital status of the respondents	187
Figure 73: Educational status of the respondents	188
Figure 74: Educational status of the respondents by gender	188

Figure 75: Households' land size by migration history	189
Figure 76: Sampled households by income categories	190
Figure 77: Primary occupation of the sampled households	190
Figure 78: Secondary occupation of the sampled households	192
Figure 79: Sources of income for the sampled households	192
Figure 80: Households' income status by migration history	193
Figure 81: Sampled households by expenditure categories	193
Figure 82: Household expenditure categories by migration history	194
Figure 83: Household savings by history of migration	195
Figure 84: Surveyed households by history of migration	195
Figure 85: Sampled households by migration and destinations	196
Figure 86: Proportion of households by number of migrants and gender	197
Figure 87: Remittances received by the household	197
Figure 88: actors that determine destinations	198
Figure 89: People's perception of climate change proxies and environmental hazards in their livelihoods	199
Figure 90: People's perception of climate change proxies and environmental hazards in their livelihoods	200
Figure 91: Practice of climate change adaptation at the household level	200
Figure 92: Measures adopted by the surveyed households to adapt against climate change	201
Figure 93: Probability of CC and ED affecting migration decisions	202
Figure 94: Role of non-climatic factors in affecting migration decisions	203
Figure 95: Households affected by climate change and environmental degradation and their migration history	204
Figure 96: Migration affecting various social groups	204

ACRONYMS AND ABBREVIATIONS

ADB	<i>Asian Development Bank</i>
BBS	<i>Bangladesh Bureau of Statistics</i>
BCCSAP	<i>Bangladesh Climate Change Strategy and Action Plan</i>
CBO	<i>Community-Based Organization</i>
CBS	<i>Central Bureau of Statistics, Nepal</i>
CDMP	<i>Comprehensive Disaster Management Programme</i>
CoP	<i>Conference of the Parties</i>
CSO	<i>Civil Society Organization</i>
CVFS	<i>Chitwan Valley Family Study</i>
DDC	<i>District Development Committee</i>
DDMC	<i>District Disaster Management Committee</i>
DFID	<i>Department for International Development, United Kingdom</i>
DoFE	<i>Department of Foreign Employment</i>
DRR	<i>Disaster Risk Reduction</i>
EU	<i>European Union</i>
GCC	<i>Gulf Cooperation Council</i>
GDP	<i>Gross Domestic Product</i>
GLOF	<i>Glacial Lake Outburst Floods</i>
ICIMOD	<i>International Centre for Integrated Mountain Development</i>
IMDMCC	<i>Inter-Ministerial Disaster Management Coordination Committee, Bangladesh</i>
INGO	<i>International Non-Governmental Organization</i>
IOM	<i>International Organization for Migration</i>
IPCC	<i>Intergovernmental Panel on Climate Change</i>
LAPA	<i>Local Adaptation Plans for Action</i>
MECC	<i>Migration, Environment and Climate Change</i>
MoA	<i>Ministry of Agriculture, Bangladesh</i>
MoDMR	<i>Ministry of Disaster Management and Relief, Bangladesh</i>
MoEF	<i>Ministry of Environment and Forests, Bangladesh</i>
MoF	<i>Ministry of Finance, Bangladesh</i>
MoFALD	<i>Ministry of Federal Affairs and Local Development, Nepal</i>
MoFSC	<i>Ministry of Forests and Soil Conservation, Nepal</i>
MoLE	<i>Ministry of Labour and Employment, Nepal</i>
MoPE	<i>Ministry of Population and Environment, Nepal</i>
NAPA	<i>National Adaptation Programme of Action</i>
NPC	<i>National Planning Commission, Nepal</i>
NCVST	<i>Nepal Climate Vulnerability Study Team</i>
NDMC	<i>National Disaster Management Council</i>
NGO	<i>Non-Governmental Organization</i>
NPR	<i>Nepali Rupees</i>
NRB	<i>Nepal Rastra Bank</i>
PDNA	<i>Post-Disaster Needs Assessment</i>
SAARC	<i>South Asian Association for Regional Cooperation</i>

SAWTEE	<i>South Asia Watch on Trade, Economics and Environment</i>
SLR	<i>Sea-level rise</i>
UNDP	<i>United Nations Development Programme</i>
UNEP	<i>United Nations Environment Programme</i>
UNFCCC	<i>United Nations Framework Convention on Climate Change</i>
UNFPA	<i>United Nations Population Fund</i>
VDC	<i>Village Development Committee</i>
YPSA	<i>Young Power in Social Action</i>



A man is holding his previous house picture which was affected by sea-level rise, Maldives.

GLOSSARY

The available literature on climate change and migration differs in opinions and definitions. This chapter will use the following terminologies proposed by the *Migration, Environment and Climate Change: Evidence for Policy (MECLEP) Glossary of IOM (2014)* and from other IOM sources.

Environmental migrants: “Environmental migrants are persons or groups of persons who, predominantly for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their country or abroad.” (IOM, 2014a:13)

Internally displaced persons: “Persons or groups of persons, who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border”. (IOM, 2014a:12)

Population Movement: The movement of a person or a group of persons, either across an international border, or within a country. It encompasses any kind of movement of people, whatever its length, composition and causes; it includes movement of refugees, displaced persons, economic migrants, and persons moving for other purposes, including family reunification. This includes the status of any person who is moving or has moved across an international border or within a State away from his/her habitual place of residence, regardless of:

- (1) the person’s legal status;
- (2) whether the movement is voluntary or involuntary;
- (3) what the causes for the movement are; or
- (4) what the length of the stay is.

Orderly movement of people: The movement of a person from his or her usual place of residence to a new place of residence, in keeping with the laws and regulations governing exit of the country of origin and travel, transit and entry into the destination or host country.

Climate change: A change in the climate that persists for decades or longer arising from either natural causes or human activities.

Environmental Degradation: The reduction of the capacity of the environment to meet social and ecological objectives and needs.

Chars: Chars is a Bangla term for sandbars located in and around rivers.

Monga: Monga is a Bangla word that refers to the period between March–April and September–October months (period following the planting and before harvest) in Bangladesh during which time there is very little work in rural areas. Due to the decline in livelihoods during this time, a temporary situation of poverty and hunger prevails which accelerates out-migration from the affected areas.

Upazila: Sub district, fourth administrative level of Bangladesh.

Union Parishad: Lowest administrative level of Bangladesh.

Zila: District, second administrative level of Bangladesh.

EXECUTIVE SUMMARY

Introduction

South Asia, comprising eight countries including Bangladesh, the Maldives and Nepal, is affected by a range of natural disasters including floods, glacial lake outburst floods, storm surges, droughts, cyclones and heavy precipitation. These disasters take a huge toll on communities and displace thousands of people every year. The impacts of natural hazards in the region are amplified by poor infrastructure and economic fragility. Many millions of people in the region also depend on land resources for their livelihoods and live in environmentally vulnerable areas.

The Intergovernmental Panel on Climate Change (IPCC) has predicted that slow-onset disasters and sudden-onset disasters will increase in severity and frequency, threatening lives and livelihoods across the region. The IPCC also speculates that although current population movements are driven by economic and social factors, the environment will have a significant impact on migratory flows in the future (IPCC, 2014b). The Internal Displacement Monitoring Centre estimates that 7.9 million people were displaced in 2015 due to sudden-onset disasters in South Asia (IDMC, 2015). It also estimates that global internal displacement was over 203 million between 2008 and 2015. South Asia is one of the most vulnerable and disaster-prone regions. The subregion alone accounts for 36 per cent of the total global displacement estimated by IDMC.

In order to assess the climate change, environmental degradation and migration nexus in South Asia, the International Organization for Migration (IOM) has undertaken research, including an assessment study, field research and national consultations in Bangladesh, the Maldives and Nepal to establish the evidence base and raise awareness on the subject. Bangladesh, the Maldives and Nepal have been selected for this project because of their commonalities, including high rates of urbanization and international migration (though the Maldives is an exception as it experiences net in-migration) and their high levels of exposure to diverse climatic events. The experiences of these three countries provide lessons for the region, as other countries in South Asia face similar challenges relating to environmental degradation and climate change.

Through this project, IOM has contributed to national and regional policies to address the expected impacts of climate change and environmental degradation on migration and displacement. The project activities focused on:

1. Assessing existing evidence of the linkages between climate change, environmental degradation and migration through a policy and literature review and a field study in Bangladesh, the Maldives and Nepal.
2. Drafting a regional strategy framework and model Plans of Action (POAs) based on a consultative process and linked to existing action plans and policies.
3. Organizing a regional dissemination meeting for policymakers to present the assessment study, model POAs and regional strategy framework.

Project background

Climate change and environmental degradation have severely affected South Asia over the last few decades. Within this subregion, the countries of Bangladesh, Maldives and Nepal are recognized as highly vulnerable to these impacts, given their unique geographical characteristics. In Bangladesh, the coastal zone, consisting of 19 out of 64 districts, may be the most vulnerable hotspot for migration due to cyclones and storm surges, salinity intrusion, coastal erosion, flood, water logging, and potential sea-level rise. The Maldives, composed of atolls, is exposed mainly to sea-level rise, cyclones, salinization, coastal erosion, flooding and heavy rainfall. Nepal is very vulnerable to glacial lake outburst floods, flash floods, extreme rainfall, rising temperatures, droughts and environmental degradation.

The field study conducted in Bangladesh, Maldives and Nepal applied a common research methodology, including quantitative (household survey) and qualitative methods (focus group discussions, key informant interviews and community consultations) to capture evidence on the relationship between climate change, environmental degradation and migration.

In Bangladesh, the study was conducted in Khulna district on the southwest coast, which is prone to cyclones, salinity intrusion and sea-level rise; Rajshahi in the north, prone to droughts and arsenic contamination, Sunamganj in the northeast wetland area, susceptible to flash floods and Patuakhali district on the central coast, affected by cyclones, storm surges and sea-level rise. In total, 320 households were surveyed in four study districts (80 households per district). In addition, twelve focus group discussions, 24 key informant interviews and four community workshops were held.

In Nepal, the study was conducted in five Village Development Committees (VDCs) of Darchula district, namely: Bhagawati, Dattu, Uku, Lali and Shankarpur. The main criteria for site selection included climate change vulnerability, complex topography, low development interventions, and increasing outmigration. The Nepal study surveyed 323 households and included nine focus group discussions, 20 key informant interviews, one community consultation workshop and more than 10 informal interviews.

In the Maldives, temperature rises, cyclones and storm surges, salinity intrusion, rainfall variation, coastal erosion, sea-level rise, and cold waves are common hazards affecting the people of all study islands including LH. Naifaru, N. Holhudhoo, H.DH. Hanimaadhoo and K. Malé. In addition, water pollution, ground water decline and tsunamis also affect the study population. The Maldives study involved a survey of 320 households, 10 focus group discussions and 27 key informant interviews.

KEY FINDINGS

Bangladesh

The IDMC (2015) recognizes Bangladesh as one of the most at-risk countries in the world, highlighting the danger of future climate change impacts. Kniveton et al. (2013) estimate that around 9.6 million people, excluding temporary and seasonal migrants, will migrate due to climatic factors between 2011 to 2050 in the country. According to Displacement Solutions (2012), nearly 6 million people have already been displaced due to climatic effects in Bangladesh. River bank erosion alone causes displacement of around 100,000 people every year in Bangladesh (Rahman, 2014). However, the total number of people who remain displaced after initial displacement due to natural disasters is unknown (IDMC, 2015).

The field study revealed that respondents perceived four major natural hazards as influencing migration decisions at the household level in Khulna. These included cyclones (more than 47 %), salinity intrusion in soil (around 44 %), salinity intrusion in water (43 %) and some respondents also mentioned riverbank erosion (10 %). In Patuakhali, cyclones were identified by nearly 44 per cent of the participants as a primary reason for migration, along with salinity intrusion in water by nearly 18 per cent and also in soil by 15 per cent of respondents. This shows that natural hazards, exacerbated by climate change, are serious concerns and are considered by households in their decisions to migrate. Riverine floods and flash floods were major factors influencing migration in Sunamganj. The respondents from Rajshahi, however, did not identify any specific climatic and natural hazards as influencing their decision-making processes relating to migration. Rather, they primarily identified non-climatic factors as the reasons motivating migration decisions. Some other factors that influence migration identified by the households surveyed were land ownership, household size and household income. In Bangladesh, the common climate change elements that affected lives and livelihoods in all study locations were temperature increases and variations in rainfall. It was found that the coastal study districts e.g. Khulna and Patuakhali were very vulnerable to both rapid onset events and processes, such as cyclones, storm surges, tidal floods and slow onset events, like salinity intrusion and sea-level rise. While drought in the northern parts of Bangladesh (Rajshahi) and flash floods, as well as riverine floods in the north east (Sunamganj), make people's lives difficult.

Looking at the policy framework, it appears that the Government of Bangladesh recognizes migration in both climate change related policies and strategies, such as the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) (2009), the National Adaptation Programme of Action (NAPA) and the macro development plan (e.g. Seventh Five Year Plan). A strategy dedicated to climate-induced internal displacement has been developed, and is the first policy in Bangladesh of its kind. However, it has obvious limitations, such as its narrow focus on internal displacement. It also does not deal with people who might choose to migrate voluntarily and abroad in the face of climatic stressors.

Maldives

The Maldives is highly vulnerable to sea-level rise, cyclone and storm surges, coastal floods, coastal erosion and variations in temperature and rainfall. The country is also exposed to a number of environmental threats including earthquakes and freshwater scarcity. The IPCC has stated that "in small island nations inundation due to sea-level rise and storm surges could lead to significant movements of people, which could in turn initiate larger

migrations which, over a number of years, will lead to severe disruptions of settlement patterns and result in social instability in some areas” (IPCC 1990:3; IPCC 1992: 55, 89). Despite this and though the evidence on sea-level rise is still scant, studies also show that the costs for adaptation on islands is deemed too high to be economically feasible, lending support to the idea of migration (CDKN, n.d.:22). The single largest natural disaster to impact Maldives in recent history was the Indian Ocean tsunami of 2004, which occurred on 24 December of that year, and displaced large numbers of people internally. The tsunami increased awareness among residents of the fragility and vulnerability of the country in the face of climate change and natural hazards. More than 100,000 citizens were impacted either directly or indirectly by this catastrophic event; 82 people died, 26 went missing and 1,313 were injured. More than 15,000 people were displaced (Government of Maldives, Ministry of Planning and National Development, n.d.).

The field study in the Maldives revealed that the majority of the respondents (37%) perceived migration as partially forced and 15 per cent of the respondents perceived it as completely forced. On the other hand, 22 per cent have stated that migration is undertaken entirely on a voluntary basis, followed by 18 per cent of respondents who stated that migration is somewhat voluntary. The 30 migrant households interviewed in Male’ are internal migrants from the outer islands.

The field study also suggested that climate change will impact livelihoods from sectors such as fisheries and tourism, as well as affecting education and health, which in turn will restrict the day to day activities of communities. Though none of the respondents linked these factors to current migration flows, all key informants during the interviews pointed to environmental degradation, including from tidal waves, sea wells, coastal erosion, as affecting people’s lives and livelihoods. The study also indicated that non-climatic factors, such as the remoteness and isolation of islands (in terms of population size or size of the islands), lack of mobility and service provision constraints, such as education, health and jobs, are the major reasons for migration. Though at present non-climatic factors are dominant in the rationales given for migration, it is likely that intensified environmental degradation and climate change will compound these issues and contribute further to people’s motivations for migration. In Maldives, temperature increases, cyclones, storm surges, salinity intrusion, rainfall variation, coastal erosion, sea-level rise and cold waves are common hazards that affect the people of all study islands including LH. Naifaru, N. Holhudhoo, H.DH. Hanimaadhoo and K. Malé. In addition, tsunamis, water pollution, poor ground water quality also affect the study population.

Nepal

As mentioned above, glacial lake outburst floods, riverine floods, excessive rainfall, landslides and earthquakes often affect people in Nepal. During the flood of the Koshi River in 2008 in the east of the country, the river burst through an embankment at the Koshi dam, affecting 109,817 people (around 18,238 households), and 1,314 hectares of land was lost (MoHA and DPNep-Nepal, 2011). Around 65,000 people were displaced in Nepal and another three million in Bihar, India (NCVST, 2009). Earthquakes can also lead to increased rural to urban migration and recent events like the 1988 Udayapur Earthquake and the 2015 Gorkha earthquake have left many people homeless. This is further exacerbated by the high risks posed by landslides and floods (MoHA and DPNep-Nepal, 2015). Earthquake is also a major environmental factor in Nepal that displaces people and influences their migration decisions.

In the field research, the sampled households suggested that they do not perceive climate change impacts (like altered rainfall patterns, irregular floods, floods during the monsoon season, fresh water scarcity, declining ground water levels, heat waves, landslides, strong winds and temperature increases) to be a direct contributor to migration; however, the uncertainties in their livelihoods options, which could be a manifestation of the impacts of climate change and environmental degradation, can indirectly drive human mobility. At the local level, when land is lost to floods or landslides, people tend to move to the Tarai or go to India, but when drinking water sources dry up, they tend to fetch water from lower down the slope or move to another place with a water source within the village. On the other hand, 98 per cent respondents identified poverty as the main factor that causes migration. Similarly, access to services is also one of the reasons for migration, both temporary and permanent. Migration for educational purposes was regarded as a factor driving migration by 72 per cent of people interviewed. Research in the district of Darchula indicated a set of major climate change induced hazards that affect lives and livelihoods. These mainly include temperature rises, strong winds, changes in rainfall pattern, drought conditions, floods and heat waves. The main non-climatic factor identified was poverty, which was a concern for people in all three study countries.

In terms of policies, the Government of Nepal prepared a Climate Change Policy (CCP) in 2011. This clearly recognizes the impacts of climate change on livelihoods and therefore prescribes adaptation actions. However, CCP does not explicitly address migration, displacement or relocation (Government of Nepal, MoE, 2011a). The “Nepal Disaster Report 2015”, published after the Gorkha Earthquake displaced over 600,000 indicates a major gap in establishing the linkages between disasters and displacement and the humanitarian crises for those affected (Government of Nepal, MoHA and DPNet-Nepal, 2015).

CONCLUSIONS AND RECOMMENDATIONS

The study indicates that all three countries have experienced variations in temperature and rainfall in recent decades. Environmental degradation including pollution of surface water, ground water, deforestation, freshwater scarcity, declining ground water levels and so on are also affecting the three countries. Other natural disasters, e.g. earthquakes, landslides, tsunamis, epidemics and non-climatic factors, including poverty and population density, may further contribute to the movement of people.

All three study countries of Bangladesh, Nepal and the Maldives, are hotspots for climate change and climate variability issues. Sudden and slow onset climatic events often affect the lives and livelihoods of vulnerable people across the three countries. Many respondents in Bangladesh identified climatic hazards, for example cyclones, storm surges, salinity intrusion in water and soil, and floods as increasing migration flows. This might be because people living in the rural areas especially in the coastal areas of Bangladesh are often affected by hazards that are directly linked to climate change, such as cyclones and storm surges. Respondents in Nepal and Maldives did not identify climate change as a major factor impacting current migration flows, however they did identify indirect factors which can be exacerbated by climate change, especially poverty. Poverty was singled out as a primary driver of internal migration in all three countries.

The study also reviewed the relevant policy instruments and institutional arrangements to consider whether climate change and migration issues are reflected in regional level commitments. In 2010, the South Asian Association of Regional Cooperation (SAARC) developed the “Thimphu Statement on Climate Change”, aimed at reducing climate vulnerabilities and enhancing resilience. This statement built upon a previous SAARC Action Plan on Climate Change developed in 2008. In terms of references to migration, the Kathmandu Declaration 2014 recognized labour migration and emphasized the need for proper facilitation and management. The policy review therefore indicates that both at the regional and national level in the study countries, climate change and migration are separately acknowledged as critical issues related to development. The nexus between climate change and migration, however still does not receive sufficient attention, particularly in the policy documents of the Maldives and Nepal.

The study makes the following major recommendations to address climate change risks and to facilitate migration as an adaptation strategy in the study countries (details in sections 5, 6 and 7 of the report):

- a) **Facilitate awareness and consultation on climate change and migration issues from national levels to grass root levels:** Climate change impacts are very visible but unfortunately people’s awareness about climate change and its consequences is still inadequate. It is important to undertake large-scale awareness raising campaigns on the impacts of climate change and relevant adaptation strategies, especially in rural areas.
- b) **Evidence-based knowledge generation and dissemination at all administrative level (Local to National):** The awareness campaigns or any other possible intervention activities from the local to the national level should be based on scientific research. The existing scholarly work is insufficient and more attention needs to be given to field work to generate better understandings of the migration, environmental degradation and climate change nexus, especially in Nepal and Maldives. The research findings and lessons need to be disseminated at local, district and national levels mainly at professional and institutional levels for effective planning and wider benefits.
- c) **Capacity building for vulnerable populations, migrants and officials:** It is necessary to develop the skills of potential migrants so that they can acquire decent jobs in destination regions. Training Manuals can be developed/revised (if currently available) based on the identified relevant issues and the target audiences. Officials of local government institutes may be trained to facilitate migration issues in the affected areas. A strategy could be developed to orient/build capacity to ensure that remittances received are used effectively by the communities or appropriately saved.
- d) **Enhanced data collection and research related to migration and climate change:** A comprehensive database on both international and internal migrants at places of origin would be instrumental for enriching the policy processes. Detailed research covering wider geographical areas (with larger sample sizes) analysing the relationship and significance between migration, environmental degradation and climate change is extremely important for using migration effectively as an adaptation strategy.
- e) **Evidence-based policy, legal and institutional frameworks to address climate migration:** There is a strong need for enhancing the policy, legal and institutional framework to address climate migration in the region. This would include standard

operating procedures on how to address sudden and slow onset events, as well as planned relocation from areas facing irreversible climate impacts. This would also enable increased coordination among different government agencies to address this issue.

- f) **Programmes and projects on natural resource-based livelihoods and basic services:** Programmes and projects need to be initiated to protect natural resources, low lying areas, agricultural fields and water resources to ensure the livelihoods of the local communities are protected. Context-specific low cost technological options also need to be considered, especially in agriculture and water supply. Migrant Resource Centres (MRCs) can be set up in hotspots and other areas where climate migration is frequent. Collaborative programmes can be set up with information on employment options, to assist migrants to find decent jobs at their destinations.

1

INTRODUCTION

Natural hazards, although not a new phenomenon in South Asia, are increasing in frequency and intensity and are exacerbated by climate change. Together, these phenomena create increasing pressures which have direct and indirect impacts on human lives and livelihoods, as well as on environmental, social and economic infrastructure. In South Asia, affected populations are experiencing impacts relating to crop productivity, livestock rearing, infrastructure, human health, water resources and livelihood opportunities. These impacts and processes can lead to increasing mobility, as vulnerable populations use migration as an adaptive strategy to deal with the combined effects of climate change and environmental degradation. Although these dynamics are linked to a range of factors beyond environmental events (political, economic, security, social and cultural, etc.), the question of “climate migration” has emerged as a global issue of interest, albeit contentiously in climate change discourses.

Existing studies explore how the relationship between climate change and migration is complex and dependent on a number of social, economic and political factors (Foresight, 2011; Jager et al., 2009 in ADB, 2012; IOM, 2014b; IOM, 2016a). The lives and livelihoods of many people, especially in rural areas, depend on access to and use of key environmental resources, including land and water. Climatic and environmental hazards affect these vital resources, potentially resulting in declining quality and reduced availability. Some environmental processes are accelerated by climate change – such as floods (riverine floods, flash floods, glacial lake outburst floods, coastal floods), droughts, cyclones and storm surges, sea-level rise, salinity intrusion in water and soil, glacial retreat and variations in temperatures and rainfall – and can directly and indirectly cause the displacement of communities.

Other natural and environment related hazards, for example, earthquakes, epidemics, as well as non-climatic factors, including poverty, increased population density, governance, political pressures and social insecurities, are also catalysts for migration. For some people residing in environmentally vulnerable areas, these climatic and non-climatic factors together contribute to increased vulnerability. Those with no other options in terms of livelihoods are forced to move or are displaced. Displacement also occurs as a consequence of sudden onset disasters. Some people migrate proactively, either as a family, or as single members of a household to supplement their family’s income back home, which can be understood as a form of climate change adaptation. Finally, many others may not have the resources to move, but as they reside in high risk areas, governments may decide to embark on “planned relocation” of vulnerable populations to safer areas.

The impact of climate change and environmental degradation in South Asia has been felt for a number of decades, especially since the 1990s. Many of the countries in South Asia (e.g. Bangladesh, Nepal, Pakistan and Afghanistan) are considered to be “Least Developed Countries” (LDCs), characterized by low per capita incomes and high population growth rates, most being in the bottom half of the human development index and therefore the impact of climate change has the potential to be more profound.

2

OVERVIEW OF THE CLIMATE CHANGE, ENVIRONMENTAL DEGRADATION AND MIGRATION NEXUS

The Intergovernmental Panel for Climate Change (IPCC) First Assessment Report in 1999 predicted that climate change would have a serious impact on human migration. This prediction was reiterated in the IPCC's Fifth Assessment Report (IPCC, 2014b). While there are established links between natural disasters, climate change and human migration, the migration, environmental degradation and climate change nexus has only recently received attention at global, regional and national levels.

Addressing the challenges of climate change and migration is compounded by the lack of clarity around definitions relating to human mobility in the context of climate change and the multi-causal nature of migration where climate change may only be one of many other factors. Additionally, authors identify the difficulty of quantifying environmental migrants (ADB, 2012; Foresight, 2011; Warner, 2012; Boano, Zetter and Morris, 2008; Castles, 2002; IOM, 2014b; IOM, 2016b). The Asian Development Bank (2012) report also discusses the methodological limitations of quantifying the numbers of people on the move and undertaking vulnerability assessments.

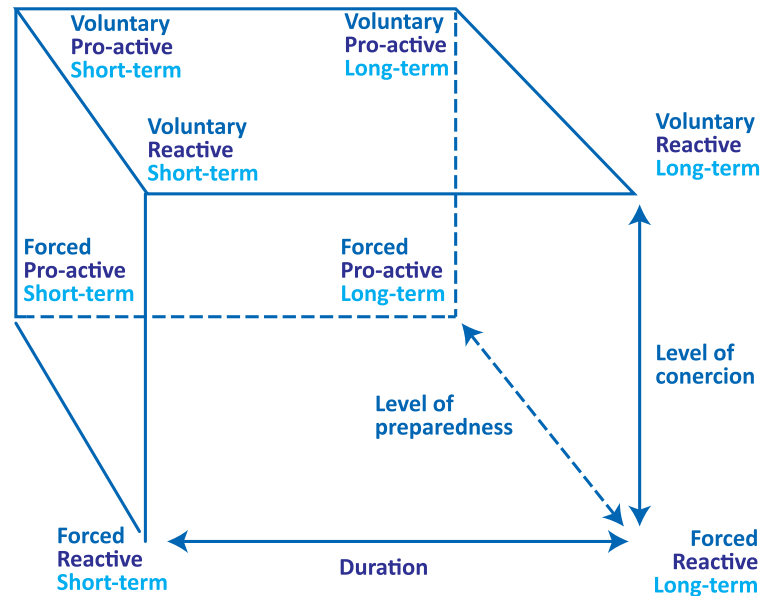
Nonetheless, the IPCC's Fifth Assessment Report (2014) suggests that extreme weather is one of the most distinct manifestations of climate change, which impacts on migration trends. The report also suggests that factors like long-term environmental change, sea-level rise, coastal erosion and loss of agricultural productivity have direct and significant impacts on migration flows (IPCC, 2014b:768). To reiterate this point, the IPCC states that it is highly likely that migration and displacement will increase over the course of the twenty-first century due to climate change (IPCC, 2014b:73). This trend is already apparent, as Boano, Zetter and Morris (2008) estimate that from 1980 to 2000, 141 million people around the globe lost their homes in 3,559 natural hazard events. Over 97 per cent of these people were in developing countries. The IPCC report (2014b) further identifies that exposure to natural hazards increases when there is a lack of resources for planned migration, especially in developing countries. There is also additional pressure from extreme weather events in both rural and urban areas (IPCC, 2014b:73).

In relation to this, the Asian Development Bank (ADB, 2011) emphasizes that environmental migration patterns need to be understood across three continua of coercion, preparedness and duration, rather than as separate, clear-cut categories. Figure 1 below depicts the relationship between these aspects of environmental migration. It captures how there are many situations which do not fit neatly into established concepts such as "forced migration" or "voluntary migration," and as such these notions are better conceptualized on continua. As the report explains:

- a) In the forced–voluntary continuum, migration is compelled by a life-threatening event at one end and by an amenity migration at the other.

- b) In the short-term–long-term continuum, people are able to return to their homes after a few days at one end and they relocate permanently at the other end.
- c) In the proactive–reactive continuum, there is a carefully planned migration associated with a slow-onset environmental change at one end and an emergency evacuation at the other.

Figure 1: A Three-Dimensional View of Environmental Migration Patterns



Source: Gemenne, 2009, cited from draft edition of ADB, 2011

The idea of a continuum where migration is “neither entirely forced nor entirely voluntary, but in a grey zone in between” has also been highlighted by IOM in conceptualizing the migration, climate and environment nexus (IOM, 2014b:22). To address the challenges posed by environmental migration, this understanding of the complex drivers of displacement and migration needs to be incorporated into climate change and disaster management policies (IOM, 2013).

Warner et al. (2013) also elucidate the importance of differentiating between migration, displacement and planned relocation schemes supported by governments so that climate policies are formulated according to different country contexts and types of migration. Thus, approaches and strategies can be put in place to support and improve the resilience of affected communities. According to Gemenne and Blocher (2015), however, there is still a lack of clarity in the understanding of policymakers about migration as an adaptive measure in response to environmental change. Migration is still often considered to be a failure to adapt. This is partially due to a lack of consensus on basic concepts, terms and definitions relating to the migration, environmental degradation and climate change nexus.

3

CLIMATE CHANGE, ENVIRONMENT AND MIGRATION IN SOUTH ASIA

3.1 BACKGROUND

The countries of South Asia, including Bangladesh, Maldives and Nepal, are exposed to a range of different climate-induced hazards. Nepal is subject to flash floods and glacial lake outburst floods. The Maldives is affected mainly by sea-level rise, cyclones, salinization and coastal erosion. Bangladesh is affected by a wide range of natural hazards, including floods (riverine floods, flash floods), droughts, cyclones, storm surges, sea-level rise and salinization of water and soil. Environmental degradation, variations in temperature and rainfall are also an issue of concern for all three countries. Other natural disasters, e.g. earthquakes, landslides, tsunamis, epidemics and non-climatic factors also contribute to the movement of people.

The Internal Displacement Monitoring Centre (IDMC, 2015) estimates that over 19 million people were displaced internally in 2015 due to sudden-onset disasters. In South Asia, 7.9 million (41%) people were displaced in the same year. This report also indicates that the global internal displacement was over 203 million between 2008 and 2015. Data related to cross-border displacement is not available. The eight countries of this region together are among the most disaster-prone countries in the world and account for 36 per cent of the total global displacement (IDMC, 2015). It is imperative that South Asian countries examine how to address the displacement and migration of people in the context of climate change and environmental degradation.

3.2 EXISTING POLICY DIRECTIONS AND INSTITUTIONAL ARRANGEMENTS ON CLIMATE CHANGE, ENVIRONMENTAL DEGRADATION AND MIGRATION ASPECTS IN SOUTH ASIA

As discussed above, there is an established connection identified in the academic literature that climate change-related hazards and environmental degradation have the potential to displace affected communities and motivate them to migrate, either permanently or temporarily. In order to understand the extent to which this has been recognized by the public discourse, it is relevant to examine policy and institutional arrangements in place at the regional levels that acknowledge climate change, environmental degradation and migration. National level policies and institutions will be examined in the country specific chapters.

The SAARC recognizes climate change as a challenge and has made a number of policy decisions and action plans to avoid its associated impacts, however migration concerns

are only scantily mentioned. In 2008, SAARC developed an Action Plan on Climate Change and in 2010, Member States issued the Thimphu Statement on Climate Change to address the risks and vulnerabilities arising from this issue. Other relevant SAARC initiatives include the Natural Disaster Rapid Response Mechanism (NDRRM), SAARC Disaster Management Framework and the SAARC Social Charter. Table 4 below, examines the extent to which relevant policies and strategies address mobility in the context of climate change and environmental degradation. The identified gaps in existing policies will guide the development of a regional strategy on climate change, environmental degradation and migration in South Asia.

Table 1: South Asia policy and strategy on climate change, disasters and their reflection of migration issues

Policy/Strategy	Year	Inclusion of Migration
SAARC: Kathmandu Declaration	2014	There was no reference to the MECC nexus per se. However, the text does note “existential threats” faced by certain member states, particularly the Maldives. This could be understood as referring to climate change and human mobility. Labour migration was also mentioned for the first time in the SAARC Declaration. The Declaration specifically mentioned that the SAARC leaders “also agreed to collaborate and cooperate on safe, orderly and responsible management of labour migration from South Asia to ensure safety, security and wellbeing of their migrant workers in the destination countries outside the region.”
Thimphu Statement on Climate Change (TSCC)	2010	No
Natural Disaster Rapid Response Mechanism (NDRRM)	2011	No
SAARC Action Plan on Climate Change	2008	No
SAARC Disaster Management Framework	2006	No
SAARC Social Charter	2005	The SAARC Social Charter stated that: “States Parties shall endeavor to inculcate a culture of self-contentment and regulation where unsustainable consumption and production patterns would have no place in the society and unsustainable population changes, internal migration resulting in excessive population concentration, homelessness, increasing poverty, unemployment, growing insecurity and violence, environmental degradation and increased vulnerability to disasters would be carefully, diligently and effectively managed” (Article VIII, Para 3, SAARC Social Charter 2004).

As can be seen here – migration of people in relation to climate change and environmental degradation is scantily mentioned considering how vulnerable the South Asian region is to climate change impacts. Specific mention of the MECC nexus and how to address these

concerns practically needs to be included. However there have been some notable actions proposed by some countries in South Asia as well as the Pacific to address the needs of affected communities. For example, Maldives proposed to buy land either in India or Australia; or alternatively to create artificial islands for them (Ramesh, 2008; Hollis, 2008). Pakistan's National Climate Change Policy includes the term climate-induced migration (Government of Pakistan, MoE, 2011) while Sri Lanka has proposed relocation of coastal communities due to environmental events. Bangladesh's Disaster Management Act 2012 mentions the rehabilitation of affected people to resume the natural way of living. The background document on climate change for the Seventh Five Year Plan of Bangladesh also recognizes displacement issues.

SAARC policy and strategic documents clearly recognize the climate change, environment and disaster issues. SAARC social Charter (2004) and Kathmandu Declaration (2014) acknowledge migration issues to some extent. It may be noted that none of the SAARC policy documents provide detailed action plans or the guidance to address migration due to climate change and environmental degradation.

4

RESEARCH FRAMEWORK AND METHODOLOGY

4.1 BACKGROUND, RESEARCH QUESTIONS AND CONCEPTUAL FRAMEWORK

Various factors influence migration in South Asia, including in Bangladesh, Nepal and Maldives. These are mainly related to economic, social and cultural factors, along with climate change and environmental degradation. The linkages between extreme hydro-meteorological events and population displacement are multi-dimensional. The migration, environmental degradation and climate change relationship are complicated in the three countries. It is necessary to understand the links between climate change, environmental degradation and migration through closer study in selected areas in each country.

Research Questions

The study primarily focuses on answering the following four research questions:

- 1) What are people's perceptions of the links between climate change, environmental degradation and migration in Nepal, Maldives and Bangladesh?
- 2) What are the key climatic, environmental and non-climatic factors that influence migration in Nepal, Maldives and Bangladesh?
- 3) In what ways do national and regional policies and institutions address migration in the context of climate change and environmental degradation?
- 4) What should be the strategy to integrate climate change, environment and migration dynamics into existing national and regional policies, strategies and regulatory frameworks?

Conceptual Framework

To answer these research questions, IOM will collect data from across three South Asian countries, namely Bangladesh, Maldives and Nepal in regions exposed to environmental degradation, climate change and migration. The proposed conceptual framework will encompass not only the climatic variables that drive the climate change-migration nexus, but also the underlying non-climatic factors that directly or indirectly influence migration in South Asia. The conceptual framework (Figure 2) presents the underlying aspects of the climate change, environmental degradation and migration nexus, exploring the non-climatic as well as climate change-related hazards, their impacts on environment and society, the catalyzing factors that may adversely affect the already existing negative impacts, and adaptation mechanisms. Data has been collected from both migrant and non-migrant households as planned and designed in the overall research plan (see section 4.2 below) and using study tools (e.g. survey questionnaire, checklists for FGDs, and KIIs) explained in the following sections.

In the conceptual framework, climate change related variables are divided into rapid and slow onset events. Rapid onset events across the three countries include storm surges/tidal surges, floods/water logging, flash floods, glacial lake outburst floods (GLOF) etc. These rapid onset events in turn have secondary climatic hazards of which the most adverse are coastal erosion and salinity intrusion in soil and water from storm surge/tidal surge; river bank erosion and inland flooding from flood/water logging; and landslides from flash floods and GLOFs. Tropical cyclones are an unexpected climatic phenomenon that come with secondary hazards that also involve heavy rainfall, submergence of land as well as salinity intrusion in soil and water. On the other hand, slow onset events include sea-level rise, ocean acidification, salinity intrusion, drought, increasing temperatures, variation of rainfall and glacial retreat. The secondary climatic hazards stimulated from these events again include coastal erosion and salinity intrusion because of sea-level rise; increased droughts because of rising temperatures; changes and lack of rainfall from variations in rainfall patterns.

Environmental degradation mainly includes pollution of environmental resources e.g. water, land and air; misuse of land, soil erosion and loss, desertification, wetlands degradation, loss of biodiversity, deforestation, mangrove destruction, lack of water flow in the rivers. Non-climatic factors which also contribute to migration decisions of the affected communities include epidemics, poverty, population density, governance, local security concerns etc. In addition, some geophysical natural hazards for example earthquakes and landslides may also influence migration.

At the same time, the study will attempt to gain a comprehensive understanding of the socioeconomic characteristics of the typical migrant due to climatic or non-climatic consequences. For this various factors need to be studied e.g. origin, economic class, gender, primary occupation, educational background, religious preferences, state of access to basic services (health and education), whether people migrate in groups, as individuals, or as entire households. Figure 3 illustrates this second conceptual framework. The framework includes types of migration, i.e. the degree to which migration is forced or voluntary, as well as seasonal, temporary or permanent, and the destination of migration to identify whether the people have moved internally or across borders. Finally, the research identified the factors that define “the choice of destination” of migrants, i.e. the distance they travel, the livelihoods at the new location, how they migrate to their new region e.g. through networking or other means, and the environment in the destination area among other factors. The research also considers the impact of migration on the households that are left behind, as well as the gender-differentiated impacts of migration.

After the data on climate change-induced hazards and environmental degradation was collected alongside migration trends, the study ascertained the links between the two. In theory, climate change and environmental degradation primarily affect livelihoods, natural resources, fisheries, forestry and livestock, production of crops, water supply and sanitation, infrastructure, human health etc. Agriculture, fisheries, livestock and other sectors and sub-sectors are largely affected by flood, drought, cyclone and storm surge, variations in temperature and rainfall and so on. These cause a reduction of overall agriculture production. Salinity and arsenic in ground water challenge the irrigation system resulting in a decrease of main crop production e.g. rice in many districts. Some non-climatic factors, as mentioned above, catalyze this adverse situation. Affected communities may try to adjust in many ways with the changing conditions within the vulnerable areas. To determine whether migration is an adaption strategy, the study listed these different adaptation strategies and coping mechanisms, such as switching to alternative livelihood options or migration.

Figure 2: Conceptual framework for climate change, environmental degradation and migration nexus in South Asia

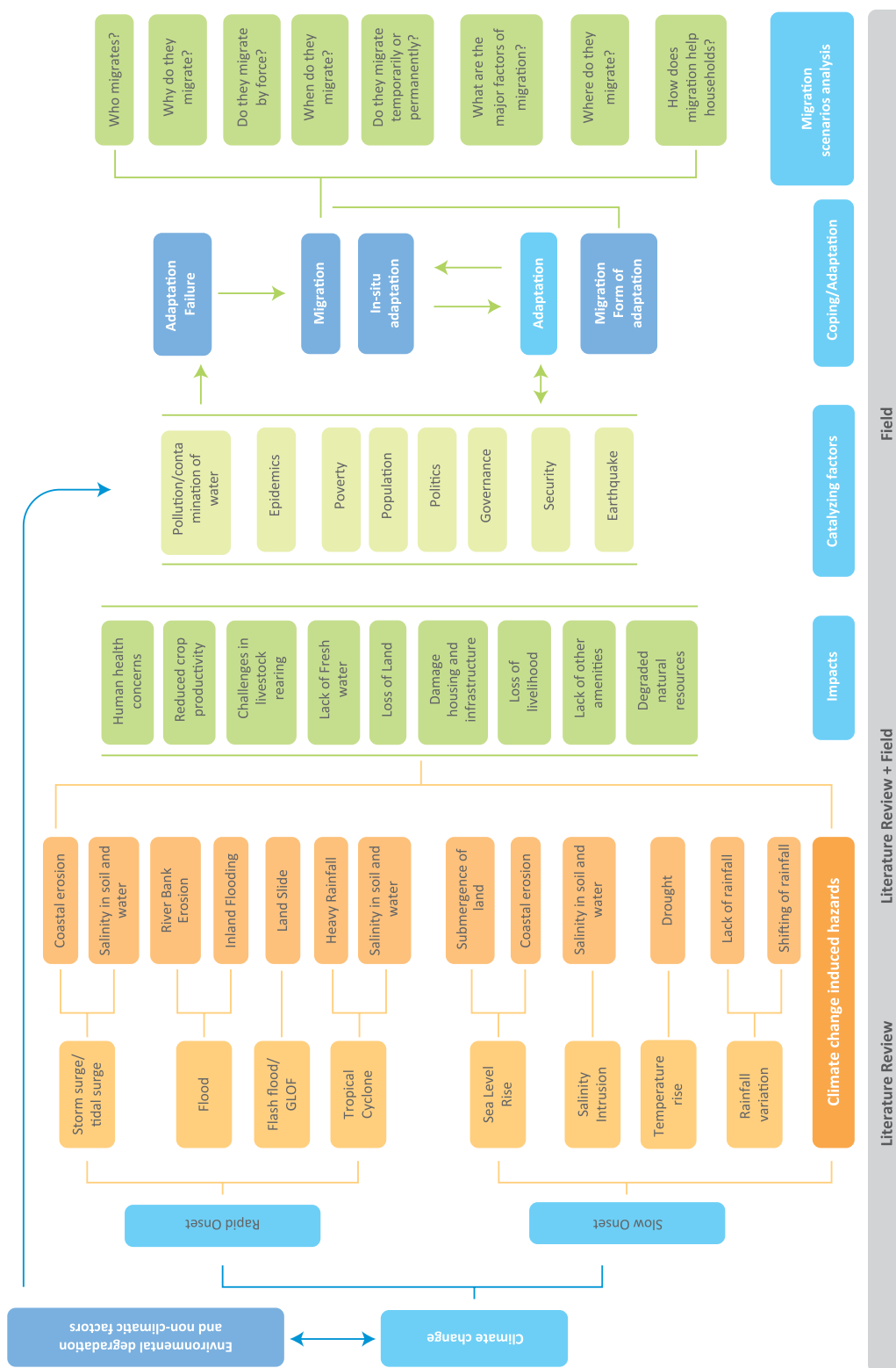
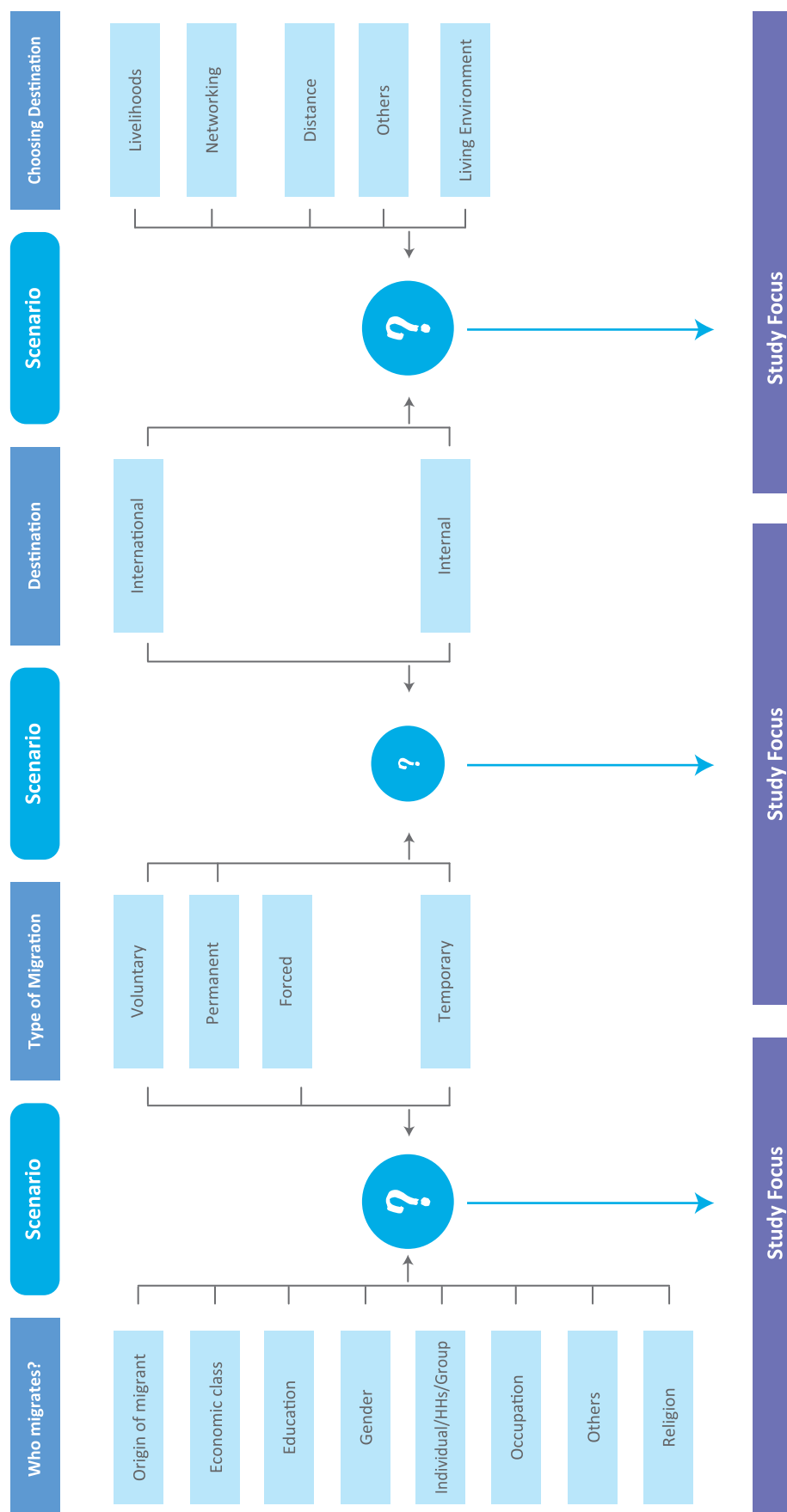


Figure 3: Conceptual framework for climate change and migration nexus in South Asia



Source: Rabbani, 2015

4.2 RESEARCH PLAN

The research plan follows a systematic approach beginning with a secondary review of literature, available data and policies, followed by consultation with key stakeholders and collection of primary field data and information through household surveys, focus group discussions (FGDs), key informant interviews (KIIs) and community workshops.

This research incorporates the recommendations made by Gemenne and Blocher (2015) to take a comprehensive approach which takes into consideration of both migrant and non-migrant families in the sampling. This kind of comprehensive research can then provide empirical evidence to policymakers to assess whether migration can be used as an adaptation measure for climate change-affected communities.

The research plan considers the following steps to respond to the questions of the study:

4.2.1 Desk Review of relevant literature, policies and scientific research

The in-depth literature review evaluated the evidence and opinions from previously published scientific reports and articles related to the climate change, environmental degradation and migration nexus, while also looking at the policies and strategies that are applicable to the topic. Although there were no specific policies for environmental migrants, the international, national and regional policies, instruments and frameworks relevant for human mobility in the context of climate change were studied. Some of these were the Thimpu Statement on Climate Change (2010) and Dhaka Declaration (2008) at the SAARC level; Cancun Adaptation Framework Conference of the Parties (COP) 16, United Nations Framework Convention on Climate Change (UNFCCC) 2014, The Hyogo Framework, the Sendai Framework, the Nansen Initiative and others at the global level. Relevant policies at the national level and agreements, declarations and statements at the regional level were taken into consideration at the in-depth literature review section to identify gaps and facilitate integration of climate change and environmental degradation induced migration into the existing policies for South Asia.

4.2.2 Field Data Collection

The following steps describe the details on field data collection:

Selection of the study sites

In Bangladesh, based on the review of secondary data/information, expert inputs from the Project Advisory Committee (PAC), the United Nations Development Assistance Framework (UNDAF) priority areas and in consultation with IOM, the climate change and environmental “hotspots” (Districts) were identified as suitable locations to collect primary data and information. The study was thus conducted in Khulna district on the southwest coast, which is prone to cyclones, salinity intrusion and sea-level rise (SLR); Rajshahi in the north, prone to droughts and arsenic-contamination, Sunamganj in the northeast haor, susceptible to flash floods and Patuakhali district on the central coast, affected by cyclones, storm surges and SLR.

Next, the study team identified the most vulnerable Upazilas (sub-district) from each of the identified districts in consultation with at least two members of the District Disaster Management Committee (DDMC). Priority was given to Deputy Commissioner (DC) and District Relief and Rehabilitation Officer (DRRO). Upazila Nirbahi Officer (UNO) (chief executive officer of sub-district) and Project Implementation Officer (PIO) were consulted to identify the most vulnerable Union of the respective Upazila.

In Nepal, the study district (Darchula) was selected based on the “climate change vulnerability ranking criteria” developed by the Ministry of Population and Environment (elaborated on in the Nepal field report), which related to the complex topography of the area, low level of development interventions and increasing out-migration. The selection of the study district was also undertaken in consultation with the Project Steering Committee (PSC). Mapping of recent natural hazards in the Darchula district shows that it is highly prone to cloud outbursts and is susceptible to intense floods and landslides. The study was conducted in five VDCs of Darchula district.

In Maldives, the site selection was undertaken in close consultation with the Project Advisory Committee. Criteria were developed, along with an extensive list of potential sites. The PAC members in the first PAC meeting approved the three criteria which were presented to the PAC. Based on the criteria, four sites were selected from the list of potential sites. The criteria reflected the physical, environmental and socioeconomic vulnerabilities of the sites.

Development of data collection tools

The research team developed a semi-structured questionnaire for household data collection. The detailed household information on demography, socioeconomics, climate change knowledge and awareness, climatic hazards and environmental degradation, existing livelihoods, vulnerabilities and migration aspects were collected from each of the study locations. The survey questionnaire was developed in line with the research questions and the conceptual framework. The survey tools were tested in Sirajganj, the flood prone area in Bangladesh, Villigili in the greater Male’ area of Maldives and in Damaulliya village under Urma VDC of Kailali district of Far Western Nepal. It was then finalized in consultation with IOM and based on the inputs from demonstrations. The research team also developed the checklists for FGDs and in-depth interviews.

Sampling design for household survey

In Bangladesh, research was conducted in four most vulnerable Union Parishads from four identified Upazilas in the districts mentioned above. A two-stage-cluster sampling procedure was followed in selecting samples for the survey. The study randomly selected the villages under vulnerable Union Parishads at the first stage. In the second stage households will be selected by sequential sampling.

The sample size, for the adopted sampling procedure of the survey, was estimated utilizing the following formula –

$$n = p \cdot q \cdot (z/e)^2 \cdot de$$

Where,	p	=	Probability of a certain attribute in the study population
	q	=	(1-p)
	z	=	Value of Standard Normal Variable
	e	=	Maximum allowable error or margin of error
	de	=	Design effect

For the survey the value of these parameters were assumed as:

$$\begin{aligned} p &= 0.5 \\ q &= 0.5 \\ z &= 1.96 \text{ (at 95\% confidence level)} \\ e &= 0.06 \\ de &= 1.20 \end{aligned}$$

Putting the values of the parameter into the formula shows that an optimum sample size for the survey stands approximately at 320 households. So, the sample size was set to be 320 households.

As mentioned above, at stage one, two villages were randomly selected from each of the Union Parishads for data collection. Then the enumerators made a list of the households and categorized them as migrant (from which at least one member migrated in last 10 years) and non-migrant households (from which none of the members migrated). At stage two, 40 households were randomly selected from both migrant and non-migrant category from the selected villages. This means that the total households for each Union Parishad of each of the study districts were 80. Thus the total households for survey in four districts in Bangladesh were 320, as set out below.

Table 2: Survey coverage and sample size in Bangladesh

Study District	Study Upazila	Study Union	No. of Sample Households of the Study Area
Khulna	Koyra	Dakhin Bedkhasi	80
Patuakhali	Mohipur	Kolap ara	80
Sunamganj	Jamalganj	Jamalganj	80
Rajshahi	Godagari	Godagari	80
Total			320

In Nepal, a total of 323 households participated in the survey. The households were located in five VDCs, namely, Uku, Lali, Dattu, Bhagawati and Shankarpur VDCs of Darchula district. A two-stage cluster sampling was adopted (enumeration areas and households) in Nepal. In each of the four study VDCs, enumeration areas were selected with probability proportional to their population size. This method was chosen, because: (i) it allowed estimations of household characteristics at the district level; and (ii) the proportional selection of the enumeration areas in the district provided their best representation according to the size. This offered the best opportunity for accuracy in estimating the statistical parameters.

The sample size of households in the four VDCs of Darchula district was determined by using a statistical method with a marginal error of 0.38 per cent and confidence level of 95 per cent for collecting data. The study covered a representative sample size of 323 households through cluster sampling. Initially, Lali VDC from the study district that cover population from all ethnic and socioeconomical groups was selected as cluster for the household survey. The list of the household was prepared based on the District Disaster Management Plan and systematic random sampling method was applied to finalize the

study. The list of households were identified and categorized as migrant (from which at least one member migrated in the last 10 years) and non-migrant households (from which none of the members migrated). At stage two, 40 households (10 households from each VDC) were randomly selected from both migrant and non-migrant category from the study VDCs.

The sample size was calculated using the following formula:

$$N = \frac{p \cdot q \cdot (z/e)^2 \cdot de}{1}$$

where, p = probability of a certain attribute in the study population

q = $(1-p)$

z = value of Standard Normal Variable

e = maximum allowable error or margin of error

de = design effect

The following values of these parameters were assumed for the survey:

p = 0.5

q = 0.5

z = 1.96 (at 95% confidence level)

e = 0.06

de = 1.20

For Maldives, the below table shows the number of households included in the household survey in the four designated sites in this study. The Male' area covers 3 islands Male' Hulhu Male' and Villi Male'. Male' sample was 60, Hulhumale' 60 and Villimale' 20, respectively. Holhudhoo, Naifaru and Hanimaadhoo each site covered a total of 60 households. The total household sample is 320.

Table 3: Number of households included in household survey in Maldives

Atoll	Island	Number of Household
Hdh	Hanimaadhoo	60
N	Holhudhoo	60
K	Male' Hulhumale' and Villimale'	140
Lh	Naifaru	60
Total		320

Focus group discussions (FGDs)

In Bangladesh, to collect data and information regarding climate change, environmental degradation and migration issues, 12 FGDs were conducted to complement the survey. Eight FGDs were conducted in the four study districts, along with one FGD each in the slums of four divisions (Dhaka, Rajshahi, Khulna and Barisal). Of the FGDs conducted in each of the districts, one was conducted with women only and the other one with mixed

groups i.e. both men and women. However, the division level FGDs were mixed groups only. A range of 10–14 people were invited to participate in each FGD.

In Nepal, a total of six FGDs (three with men only and three with women only) were carried out in Uku and Lali VDCs, with at least 10 respondents participating in each of the FGDs.

In Maldives, the qualitative part of this study focussed on FGDs from the four sites which comprised of one men's group, one women's group and one mixed group in each of the four sites, except for Male', which covered one mixed FGD.

Key informant interviews (KIIs)

In Bangladesh, KIIs were conducted with the Upazila Nirbahi Officers, Upazila Statistical Officer, Chairman in the selected Union Parishads, and three local leaders from each of the selected UPs. Thus, the total KIIs were 24 from the four vulnerable project districts as mentioned above. In addition, 10 additional KIIs were conducted with senior policymakers, researchers and academicians working on climate change, environment and migration issues. In total, 34 KIIs were conducted to complement household survey.

In Nepal, ten KIIs were conducted in the district headquarters and five with the policymakers, from the Ministry of Population and Environment, Ministry of Labour and Employment and National Planning Commission. Those participating the KIIs in the district included the Chief District Officer, Local Development Officer, District Forest Officer, Warden of Api Nampa Conservation Area, District Soil Conservation Officer, District Agriculture Development Officer, Women's Development Officer of Darchula District Development Committee, VDC secretaries of Uku and Lali VDCs, and Chair of a local NGO, the Community Rural Development Society, Nepal. Additional information was gathered from the NGOs, local school teachers, community forest user committee members, local leaders and the information was used to cross-check with respondents' views.

In Maldives, in each of the communities five KIIs were undertaken and in the Male' site, 12 interviews were undertaken aimed at policymakers from the institutions listed below.

- 1) Ministry of Environment and Energy
- 2) Disaster Management Centre
- 3) National Bureau of Statistics
- 4) Ministry of Fisheries and Agriculture
- 5) United Nations Development Programme (UNDP)
- 6) Ministry of Housing
- 7) Department of Metrology
- 8) Maldives Red Crescent Society
- 9) Maldives National University (Research Department)
- 10) Department of Immigration and Emigration
- 11) Ministry of Foreign Affairs
- 12) Local Government Authority

Community workshops

In Bangladesh, The study organized four community workshops in project areas. This helped to accommodate views, opinions, and experiences of climate change impacts, environmental concerns and migration of the communities.

In Nepal, two community workshops were organized: one in Lali VDC and the other in the district headquarters. The community workshop in Lali VDC coincided with the VDC Council meeting which had the representation of all the grassroots level stakeholders, including local level elected politicians, members of the local Disaster Management Committee.

In Maldives, workshops were used as a platform to share findings of the research with the community rather than to gather field data and information for the study. The reason for this was that the study sites have limited populations and, therefore, the respondents would overlap between the individuals interviews, the FGDs and the community workshops.

4.3 LIMITATIONS OF THE STUDY

In Bangladesh, the study was conducted in only four of 64 districts of Bangladesh. Therefore, the findings may not reflect the situation in all districts of the country. The research followed a systematic approach and standard sampling procedure, but it was limited in scale under the scope of the study. Thus, the results may not be representative of the entire division or the country. The study mainly captured people's perceptions of climate change impacts, environmental degradation and the migratory links and networks within the locations. Most of the respondents had to recall from their memory to respond to many of the questions. This could affect the results of the study. People's understanding and level of awareness about climate change and its association with migration flows may also have implications for the responses. It was very difficult to find time series data on migration at Union level (the lowest administrative unit of Bangladesh) or sub-district level. The Population Census 2011, conducted by the Bangladesh Bureau of Statistics (BBS) provides district level data on migration, but it does not show any factors that influence migration flows. The perceptions captured from the survey, FGDs, KIIs and community workshops with the study population, are considered to reflect the contributing factors which affect migration flows.

In some cases, it was bit difficult for enumerators to capture the required attention of the respondents, especially of the female respondents, to gather responses from first to last questions. This was because some female respondents needed to do domestic work during the interviews. The enumerators had to be gentle to get responses on all questions, although the interviews were often long. This slightly affected the smooth flow of responses. The study also indicated that the male members of the households usually migrate from each of the study locations. It would be preferable to get responses based on the practical experiences of migrants. In many cases, a woman or a man responded on behalf of a migrant member of the household.

The study team in Nepal also experienced some methodological limitations, which have become apparent in the study. Since this was part of a regional study, which tried to follow a common framework approach to explore the phenomena of climate change and

migration, though prevalent in the region as a whole, it must be borne in mind that there are vastly different localised effects and outcomes. This is especially true even in terms of the study within Nepal because of the diverse geographical and ecological regions. While a consultative workshop of stakeholders was held in Kailali, the survey was conducted in Darchula. The survey sites/VDCs were chosen based on the suggestion of another consultative workshop in Darchula. In addition, the study employed a non-probabilistic sampling technique; implying that for nation-wide generalizability and policy inputs, an extensive longitudinal study to explore the nexus between climate change and migration is needed.

As in Nepal, Maldives also encountered some methodological limitations, since the study used the same framework and tools for the three countries. Although climate change effects are being experienced in the three study sites, Maldives being a small island nation had unique issues with regard to climate change and its impacts. The most critical aspect being sea-level rise and its impacts which threatens the very existence of Maldives with 80 per cent of the total land area being less than 1 metre above sea-level.

The study also found that in some sites the Household questionnaire was answered by young members of the family because others were away at work, thus some questions on income were not answered. In most of the study sites the male members have migrated and the households comprised of women and the children. The questions were difficult to comprehend for the respondents at the household level and in the FGDs at the community level, due to the level of awareness regarding climate change and its impacts.

5

THE BANGLADESH CHAPTER – FINDINGS OF THE STUDY

International and internal migration are common in Bangladesh. In the last century, population migration, within and out of Bangladesh, has increased due to a combination of push and pull factors. The multi-causal factors of migration include: better economic opportunities, political and demographic reasons, access to better service provision and changing environmental and climatic/weather conditions (IOM, 2008). Migration influenced by environmental degradation and climate change has received relatively little attention amongst development practitioners and policymakers in Bangladesh, even though in comparison to other countries the topic has been broached. Building on a preliminary assessment carried out by IOM (2010a), this paper aims to delve deeper into the subject.

Though Bangladesh has made significant achievements in different sectors, like primary education, maternal health, child mortality and poverty reduction, climate change, disasters and environmental degradation still threaten development outcomes and investment. In 2014, Bangladesh was ranked 1st on the Climate Change Vulnerability Index and fifth in the Global Climate Risk Index 2015 (Kreft et al., 2015). The IDMC (2015) report on South Asia also describes Bangladesh as one of the most-at-risk countries, highlighting the danger of future climate change impacts. Bangladesh's vulnerability to climate change and environmental degradation is thus manifested all over the country. In particular, southern Bangladesh is subject to cyclones and storm surge, salinity intrusion, coastal erosion, water logging, and potential sea-level rise. The northern part is vulnerable mainly to droughts, riverine floods and flash floods.

Fortunately, there have been some steps taken to address climate change and disaster management, in line with the critical importance accorded to these issues. Bangladesh has developed a climate change adaptation strategy, referred to as the BCCSAP (2009), and NAPA (2005, 2009) for implementation with support both from national and foreign investments, although currently this is insufficient to meet the identified needs (IIED, 2014).

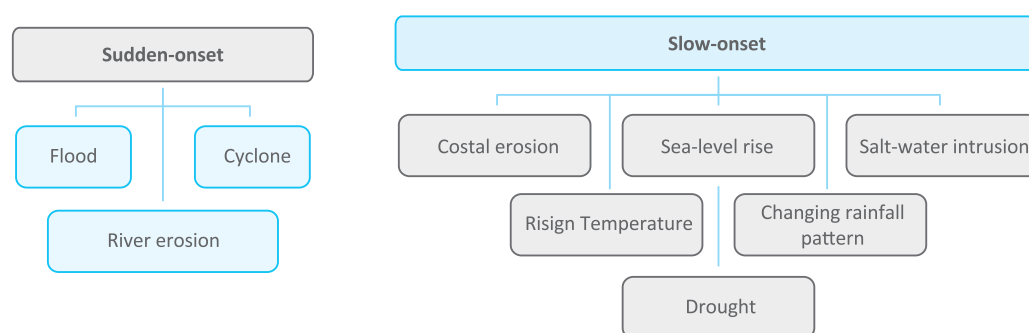
5.1 LITERATURE REVIEW ON FACTORS INFLUENCING MIGRATION IN BANGLADESH

5.1.1 Climate change related hazards and disasters

A myriad of both slow and sudden-onset natural events that are exacerbated by climate change have directly or indirectly caused people to move from their homes in Bangladesh. IOM's (2010) research on "Assessing the evidence: environment, climate change and migration in Bangladesh," presents a clear understanding of the interrelation between environmental change and migration in the country. According to this study, both sudden-onset (floods, cyclones and riverbank erosion) and slow-onset natural hazards (such as coastal erosion, sea-level rise, salinity intrusion, rising temperatures, changing rainfall and

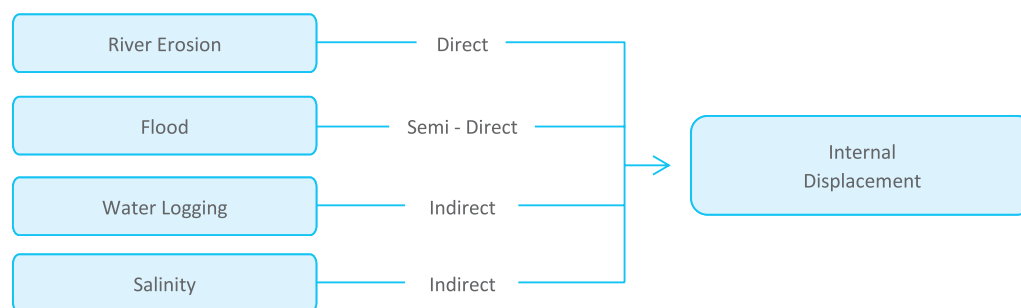
drought patterns) have an impact on migration in Bangladesh. These climatic events are illustrated in Figure 4. Individuals are displaced because of sudden onset events due to their intensity, while the slow onset events increase pressure on resources, critical to maintain livelihoods. For example, land lost to sea-level rise will reduce agricultural productivity and erode agricultural employment eventually causing many to migrate. Other recent research conducted by the Comprehensive Disaster Management Programme (CDMP) in 2014 under the Ministry of Disaster Management and Relief takes note of the four internal displacement factors (river erosion, flooding, water logging and salinity) and ways that they manifest in internal displacement in Bangladesh (Figure 5) (CDMP, 2014). This is more immediately evident in the coastal areas because of the rising sea-level. However, the CDMP initiated study limits its focus to displacement only, excluding the situation of people who might voluntarily choose to migrate. Related to this, Shamsuddoha et al. (2012) state that Cyclone Aila displaced around 300,000 people from the coast of Bangladesh. Of the 19 coastal districts, 12 districts are at most risk since these are directly on the coastline (Akter, 2009). Climatic stressors influence different types of migration in a varied manner.

Figure 4: Assessing the evidence: Sudden-onset events, slow-onset processes



Source: IOM (2010a).

Figure 5: Hazards and displacement relationship



Source: CDMP (2014).

The patterns and extent of human mobility in Bangladesh varies according to different research studies. For example, Farhana et al. (2012) found that a considerable percentage of slum dwellers in Rajshahi City i.e. 45 per cent of migrant households (113 out of 250 households) were displaced due to consequences of natural hazards like monsoon, flood and riverbank erosion. A similar study conducted by Chowdhury et al. (2012) in Sylhet found

different results, where 12 out of the 60 respondents migrated due to environmental disasters. Researchers from the organization, Unnayan Onneshan, also report that in the initial stage, migrants are likely to move over short distances to nearer locations, rather than moving to the capital or other cities (Uddin and Basak, 2012). Floods and riverbank erosion have caused major displacement over the years. The 2005 floods in Bhola forced approximately half a million people out of their homes in the region. Eventually major clusters of population were left with no choice but to find shelter in urban slums and also find employment in the metropolitan areas such as Dhaka, Rajshahi, Khulna and Chittagong. In 2009, during Cyclone Aila in Bangladesh, a total of 190 people were killed and around 4.82 million people were affected in 11 coastal districts (Leighton et al., 2011). Table 4 shows the different types of climate induced hazards, origin and destination of migration. Based on the Ministry of Disaster and Management and Relief (MDMR) 2013, the major city districts, especially Dhaka is a common destination for people displaced by disasters.



Not only houses of people are eroded away, agricultural land, schools, hospitals and other infrastructures are also destroyed. Bahuka, Ratankandi, Sirajganj, Bangladesh.

Table 4: Origin and destination of displacement according to hazards

Hazard type	Origin district (Upazila)	Destination district
River erosion	Bhola (Borhanuddin), Sirajganj (Chauhali), Shariatpur (Janjira), Nowabganj (Shibganj)	Bhola Sadar, Pabna, Sirajganj , Tangail, Naogaon, Dhaka, Chittagong, Faridpur, Chapainwabganj, Rajshahi
Floods	Chandpur (Hajiganj, Faridgong), Sariatpur (Bhederganj, Damudia), Sirajganj (Belkuchi, Kamadkhanda), Kurigram (Rajibpur, Raumari, Char Rajibpur, Raumari)	Rajshahi, Nilphamari, Rangpur, Kurigram, Gaibandha, Naogaon, Sirajganj, Chuadanga, Dhaka, Faridpur, Shariatpur, Chandpur
Water logging	Satkhira (Kalaroa) , Jessore (Manirampur, Keshabpur)	Barisal, Dhaka, Jessore, Khulna, Narail, Satkhira, Thakurgaon
Salinity	Satkhira (Shyamnagar, Assasuni), Khulna (Koyra, Dacope)	Dhaka and Rangamati

Source: collated from CDMP 2014. Locations in bold are major city/town areas.

Table 5 gives a summary description of the different hazards and how these affect migration of people as noted by different studies. As can be seen from the table, the hazards in Bangladesh are varied and affect people's livelihoods, potentially causing them to move to areas where they can cope and earn a better income. Shamsuddoha et al.'s (2012) study highlights the different ways people are displaced by environmental processes. Displacement arising from sudden onset disasters is often immediate, whereas in the context of slow onset disasters people's environment and livelihoods are gradually affected, compelling people to first undertake economic migration which might initially be temporarily or seasonal followed later by permanent migration. In the study, people who had better financial, social and human capital tended to approach migration in a more planned manner, while the poor and vulnerable who have fewer or no options were displaced or remained trapped in vulnerable locations. The Foresight (2011) report echoed the same concern for trapped populations at a global scale. It discusses environmental migration, global migration trends and particularly internal migration in low income countries, and projects that in future decades, millions of people will be trapped in areas which are vulnerable to environmental change. Foresight (2011) points out that "trapped" populations are an important policy concern and responses for these populations must be considered.

Table 5: Summary of literature on hazards and their socioeconomic impact

Type of Hazards	Study District	How these hazards influence migration
Riverbank erosion	Gaibandha, Kurigram [located in northern Bangladesh]	Mallick and Etzold (2015) examined the chars, where permanent migration takes place mainly in the case of riverbank erosion. 81 per cent of the men interviewed said that it was erosion that had forced them to migrate from their home <i>chars</i> . As these people are mainly reliant on agriculture, migration is synonymous with material losses that directly affect their livelihoods. Rahman (2010) states that riverbank erosion causes displacement of tens of thousands of people every year in Bangladesh.
	Sirajganj [located in northern Bangladesh]	According to Hutton and Haque (2004), in 1998 among 230 households in Sirajganj, 5,500 of the 30,000 slum dwellers there were riverbank erosion-affected migrants.
Water salinity, Soil salinity	Cox's Bazar [located in south east Bangladesh]	Alam (2013) states that salinity intrusion is one of the major causes of changes in agricultural land use. The salinity level has increased dramatically in the dry season during the last decade due to an increase in temperature, lower rainfall, high evaporation rate and low water discharge to the river systems.
	Khulnaw [located in south west Bangladesh]	Rahman and Siddiquee (2015) found that crop production fell drastically due to increased salinity after cyclone Aila in 2009.

	Rangpur [located in northern Bangladesh]	Ahmed et al. (2012) revealed that 93 per cent (140 out of 150) of the study households mentioned a decline in overall rainfall and at least half of them (75 out of 150 households) stated that they experienced more heavy rains than normal. Since rainfall plays a significant role for the livelihoods of the poor, such changes disturb the seasonal production cycle and threaten their livelihood security.
Extreme changes in temperature and rainfall patterns	Sylhet [located in northeast Bangladesh]	Sylhet Agricultural University (2015) mentions farmers perceive that climate has been changing for 5–15 years. In case of the rainy season, 78 per cent of farmers believed that they experience a delayed start. Majority of the farmers felt that the hot season comes early and is prolonged. Around 64.7 per cent of farmers perceived that the cold season is delayed.
	Rajshahi [located in northern Bangladesh]	Shamsuddoha (2014) finds that the changes in rainfall patterns in Rajshahi Division affect livelihoods of the people in terms of availability of water for rain-fed cultivation; water reservoirs in dry seasons, freshwater fish cultivation etc.
	Rangpur	Azad et al.'s (2013) study demonstrates that annual minimum and maximum temperature show a tendency to increase. This is likely to affect agricultural patterns and production and thus livelihoods.
	North and northwest Bangladesh	Alamgir et al. (2015) reveals that the spatial characteristics of droughts vary widely according to season. Pre-monsoon droughts are more frequent in the northwest, monsoon droughts mainly occur in the west and northwest, winter droughts in the west of Bangladesh.
Flood	Manikganj [located in central Bangladesh]	Rahman (2014) mentions floods have an adverse impact on the socioeconomic status of the people in Gopinathpur Community.

Type of Hazards	Study District	How these hazards influence migration
	Tangail (Char land) [located in central Bangladesh]	Hossain (2013) states that most of the people in the Char land face problems related to sanitation and health, and changes in food habits. The results show that most of the people lose their jobs due to floods and this leads to a decrease in their income level. Normally the intensity of floods increases in July–August and people face severe problems of food shortages, damage to crops and road infrastructure, amongst others. Various waterborne diseases, such as cholera, dysentery, fever and diarrhea occur.
Cyclone	Bagerhat, Khulna, Satkhira [located in south-west Bangladesh]	According to the Disaster Management Bureau (Bangladesh DMB, 2010) it was seen that male members of 23 per cent of all sampled households moved towards neighboring towns/cities immediately after the emergency relief works phased out (about four weeks after the incident of Cyclone Aila).

	Satkhira Khulna Noakhali Bhola Barishal Patuakhali Laxmipur Bagerhat Pirojpur Chittagong Barguna	The Disaster Management Bureau notes that 4,826,630 people were affected in 2009 Cyclone Aila, which caused huge losses in property and infrastructure, and displaced a large number of people from their homes (Bangladesh, DMB, 2009). Roy n.d found even after a year, many people were still displaced living in makeshift houses on damaged embankments without adequate food, safe drinking water, and proper sanitation facilities.
Environmental Degradation	Satkhira (Shyamnagar), Khulna (Paikgacha), Bagerhat (Rampal), Cox's Bazar (Chakaria) [located in south and southwest Bangladesh]	Miah et al.'s study (2010) demonstrated that valuable natural resources were on the verge of serious degradation by both intensified natural and man-made activities. The study clearly mentioned that the use of agrochemicals, population growth and over exploitation has degraded productive environment, having an impact on livelihoods.

5.1.2 Environmental concerns and degradation

In addition to natural disasters, environmental degradation, namely water pollution and arsenic contamination are other concerns in Bangladesh. Water pollution caused by industrial resources, sewerage, municipal solid waste, chemical fertilizers and pesticides is a routine phenomenon in Bangladesh (Rabbani et al., 2011). Arsenic contamination in groundwater has been a long known problem for the country and millions of people have been exposed to this (Allan et al., 2000; Zahid Ahmed, n.d). In conjunction with this, iron and salinity intrusion, coupled with heavy metal contamination exacerbated the decline in water quality in various parts of Bangladesh. Other environmental concerns, for example, salinity intrusion in soil, scarcity of freshwater also brings about migration (BCAS, 2014). However, there is a lack of available data and information on the relationship between specific environmental concerns e.g. arsenic contamination, fresh water scarcity and migration in the country.

Increasing pollution and contamination of water and soil is a significant concern of the people residing in close proximity to industrial areas. These factors may stimulate migration or displacement within the country. While this has not been reported as of yet in Bangladesh, the risks posed are evident when examining similar cases in other parts of the world.

5.1.3 Non-climatic factors

IOM (2008) emphasizes that the movement of human population as a consequence of climate change is unclear and unpredictable. It is difficult to establish a linear and causative relationship between anthropogenic climate change and migration with the range of social, economic and environmental factors at work. In this context, it is important to understand the non-climatic factors that are also influential in Bangladesh. These include poverty, unemployment, political, ethnic and religious tensions and conflicts, while population density, access to basic services, urbanization, social security are also influential factors (Farhana et al., 2012). These non-climatic factors, in conjunction with climatic hazards and environmental degradation may often be the reasons for catalyzing the movement of people, especially from poverty-prone areas.

5.2 MIGRATION TRENDS IN BANGLADESH

Both internal and international migration are considered to be drivers of Bangladesh's economic growth, but they are often also viewed from the perspective of challenges related to urbanization, environment and other development concerns.

The Bangladesh Bureau of Statistics (BBS, 2011) indicates that migration within the country is distinct across all its seven divisions. Dhaka is far ahead as the major destination for internal migrants, as it has received about six million migrants over the last five years (BBS, 2011). Gazipur, Chittagong and Narayanganj districts remain second, third and fourth with about 1.3 million, 900,000 and 600,000 migrants respectively for the same period. Khulna, Jessore and Sylhet accommodated approximately 300,000 migrants each. Though the BBS provides information on internal migration, it does not explain the causes of the migration trends within the district.

UNDP (2013) strongly recommends that monitoring of the population movement be improved, as internal migration is a major policy issue in Bangladesh. Emphasis is given on the use of sophisticated techniques which track migrants and collect household level data on the reasons behind migration e.g. consumption, income, environmental pressures and use and access to public services in both origin and destination locations.

It is believed, however that regional inequalities in income and access to services between rural and urban centres largely influence migration and urbanization. In addition, the lack of access to social protection and unequal capacities required to respond to natural hazards are also driving factors not only for migration but of internal displacement (CDMP, 2014).

While internal displacement of populations can be attributed to both natural and man-made crises, and as mentioned before, be multi-causal, a considerable number of people have been displaced due to natural hazards in Bangladesh. For example, 4.4 million people were displaced by Cyclone Sidr and floods in 2007 (UNOCHA, n.d.). Additionally, around 14 million people (10% of the population) were affected in 20 districts (Rahman, 2010). In 2013, Cyclone Mahasen led to the displacement of approximately 1.1 million people, while in the same year, a tornado and floods displaced 137,000 and 22,000 people, respectively. In 2014, floods displaced more than 325,000. The total number of people who remain displaced after initial displacement due to natural disasters is unknown (IDMC, 2015). According to Kniveton et al. (2013), approximately 9.6 million people excluding temporary and seasonal migrants, will migrate due to climatic factors from 2011 to 2050. Another study suggests that climatic effects have already displaced 6 million people in Bangladesh (Displacement Solutions, 2012). It is estimated that up to 100,000 persons are displaced annually due to riverbank erosion (Rahman, 2014).

International labour migration is also a prominent trend. It is considered to be a driving factor behind Bangladesh's transition to a middle-income economy, alongside the garment and services sectors (Siddiqui and Reza, 2014). It is estimated that over eight million people have migrated for work between 1976 and 2012 and that about 600,000 to 700,000 migrate annually from Bangladesh (ILO, 2014).

Thus, Bangladesh has been identified as one of the major labour sending countries in the international labour market. As a result, through overseas employment, remittances have been increasing every year, gaining an increased share in Gross Domestic Product (GDP) and export earnings. A major share of the total remittances comes from Middle Eastern countries (Farid et al., 2009). Bangladesh was among the top ten remittances recipient countries with about

USD 13.8 billion in remittances in 2013. These remittances have proven to assist vulnerable households in times of crisis and improve their resilience to natural disasters. Remittances serve as a buffer in low-income countries by providing income support after natural disasters (Kapur, 2004 and World Bank et al., 2006). This implies that the increasing access to the international labour market of Bangladeshi labour migrants could favour migration as a coping strategy as incomes earned from labour migration would complement existing livelihoods.

5.3 NATIONAL POLICY AND LEGAL INSTRUMENTS RELATED TO CLIMATE CHANGE, ENVIRONMENTAL DEGRADATION AND MIGRATION IN BANGLADESH

The first half of this section examines how some of the current key policies and legal instruments address climate change, environmental degradation and migration. The second half explains the institutions working and supporting projects and programmes related to migration of people who are impacted by climate change and environmental degradation. The gaps in both policy and institutional arrangements (especially at the national level) were also explored for potential strategic and action oriented solutions that might be considered at the national and regional levels.

Bangladesh's Prime Minister Sheikh Hasina has been very vocal about the way Bangladeshi people would be affected by climate change and how they would be displaced. She has made notable public statements at the UNGA in October 2009; SAARC Summit, 2014; and the BIMSTEC Summit, 2014 (Box 1).

Box 1: Statements by Bangladesh's Prime Minister, Sheikh Hasina on climate change and displacement

SAARC Summit, 2014: "The risks are so grave that, for Bangladesh, climate change may displace more than 30 million people by 2050."

BIMSTEC Summit, 2014: "A rise in 1 degree Celsius due to global warming would submerge a fifth of Bangladesh forcing 30 million people to become "climate migrants." This was the reason why in the 64th UNGA and every year, thereafter, I have called for a legal framework to ensure social, cultural, and economic rehabilitation of climate migrants."

UNGA, 11 October 2009: *"What is alarming is that a metre rise in sea-level would inundate 18% of our land mass, directly impacting 11% of our people...of the billion people expected to be displaced worldwide by 2050 by climate change factors...one in every 7 people in Bangladesh, would be a victim...Bangladesh would..... make a strong call for climate migrants at COP 15 to consider a new legal regime under the UNFCCC Protocol ensuring social, cultural and economic rehabilitation of climate induced displaced migrants."*

Furthermore, the Government of Bangladesh recently hosted the South Asian Inter-governmental Consultation by the Nansen Initiative, which indicates their commitment and support to addressing the issue of human mobility in the context of disasters and climate change. Short, medium and long-term strategies have been adopted to address the issues associated with climate change and environmental degradation. Bangladesh has developed a NAPA and the BCCSAP. Some other relevant policy papers and legal documents also address

climate change-induced disasters, include the Standing Orders on Disaster 2010, National Disaster Management Plan (2011–2015), Disaster Management Act 2012, Bangladesh Climate Expenditure and Institutional Review, 2012 and Climate Fiscal Framework 2014.

The following table indicates some policy documents and how they reflect the migration dimension.

Table 6: Relevant policy and strategic documents in Bangladesh and their reflection of migration issues

Government approaches to climate change and disasters	Year	Type of policy and how it reflects migration
Bangladesh Climate Change Strategy and Action Plan (BCCSAP)	2009	“A4. Assessment of climate change and its impacts on out-migration” (p. 56).
		“In the worst case scenario, unless existing coastal polders are strengthened and new ones built, sea-level rise could result in the displacement of millions of people – environmental refugees- from coastal regions, and have huge adverse impacts on the livelihoods and long-term health of a large proportion of the population”(p. 1 / Context 3).
National Adaptation Programmes of Action (NAPA)	2005	Intensity of impacts on different sectors due to climate change (p. 17/ Figure7). “Social consequences of mass scale migration to cities would to some extent be halted” (p. 36 /Project No. 11)
Disaster Management Act	2012	Migration is not stated explicitly, but the act mentions rehabilitation as “If necessary, to transfer affected people in other region to resume natural way of living.” (Article 15 (C))
National Plan for Disaster Management 2010-2015	2010	“Additionally, the poor are more vulnerable to any kind of disaster due to a) depletion of assets, b) income erosion due to loss of employment, c) increased indebtedness and d) out migration. Moreover, the cost to cope with disasters is disproportionately higher for the poor.”
National Strategy On The Management Of Disaster And Climate Induced Internal Displacement (NSMDCIID)	2015	The first policy to focus solely on MECC issues. This document focuses on the internal displacement due to climate change related disasters only. It provides a comprehensive strategy for pre, during and post displacement phases. It specifically addresses displacement due to flood, costal and riverbank erosion, cyclones and storm surges, droughts, water-logging, salinity, and landslides in the hilly regions. However, it does not emphasize voluntary migration and international migration.

The National Strategy on the Management of Disaster and Climate-Induced Internal Displacement (NSMDCIID), is the first policy in Bangladesh dedicated to address the issue. The obvious limitation is the focus on internal and displacement issues. It does not address the broader spectrum of people who might choose to migrate voluntarily and abroad, in the face of climatic stressors, by solely focusing on displacement.

5.4 INSTITUTIONAL ARRANGEMENTS TO ADDRESS CLIMATE CHANGE AND NATURAL DISASTERS, ENVIRONMENT AND MIGRATION

Exploring how disasters, climate change and environmental degradation impact human mobility requires engaging in discussions with a range of stakeholders. An effective structural coordination mechanism that involves stakeholders from the grassroots level, public and private research institutes and civil society organizations and helps promote adaptation and mitigation schemes in consultation with government ministries, multilateral and bilateral development partners might be a potentially effective form of coordination. Coordination among stakeholders is achieved through a variety of mechanisms ranging from committees at Union level, to national level committees headed by the Prime Minister. For example, the Union Disaster Management Committee (UDMC) at the Union level, DDMC at the District level and so on, to plan and implement programmes to address disasters in the country.

Displacement Solutions and Young Power in Social Action (YPSA) (2014) conducted a mapping study that notes that despite having a plethora of policies, a comprehensive institutional framework for responding to climate change and environmentally-induced migration in Bangladesh does not exist. This mapping study identified 168 institutional and organizational stakeholders and 78 resource persons at the national, regional and international levels who are directly or indirectly related to climate change and migration, including 36 Government Ministries, Departments, Institutes and Authorities; 20 International Donors and Funding Organizations; 14 National Civil Society Organizations and Networks; 45 National NGOs; 23 International NGOs; 30 Academic Institutes, Research Centres; and 78 National Experts. The following are key public institutions who are directly and indirectly engaged in climate, environment and migration centric activities.

Public Institutions: There are a considerable number of public institutions that work on climate change, environmental degradation and migration. In terms of the governmental point of view, the Ministry of Environment and Forest (MOEF) is the climate change focal point and is responsible for complying with the decisions of the UNFCCC and Kyoto Process (KP). In addition, the institutions listed below support the MOEF in climate change interventions. These are potential stakeholders that should be included in any action plan to address MECC.

- Climate Change Cell, CDMP
- Ministry of Disaster Management and Relief
- Department of Environment under MOEF
- Bangladesh Forest Department under MOEF
- Department of Disaster Management under Ministry of Disaster Management and Relief (MODMR)
- Directorate of Relief and Rehabilitation under MODMR
- Ministry of Finance (MoF)
- Economic Relation Division under MoF
- Ministry of Agriculture (MOA)
- Ministry of Water Resources (MoWR)
- Bangladesh Water Development Board under MoWR
- Water Resources Planning Organization under MOWR
- Local Government Division under Ministry of Local Government, Rural Development and Cooperatives (MoLGRDC)
- Local Government Engineering Department under MoLGRDC)
- Bangladesh Space Research and Remote Sensing Organization (SPARSO)
- Bangladesh Meteorological Department (BMD)
- Ministry of Planning
- Ministry of Health and Family Welfare
- Ministry of Information
- Palli Karma Sahayak Foundation.

Coordination among stakeholders: The Standing Orders on Disaster (SOD) is utilized by councils and committees, ranging from the local to the national level to guide their actions. The National Disaster Management Council (NDMC) and the Inter-Ministerial Disaster Management Co-ordination Committee (IMDMCC) govern disaster management policies in Bangladesh. These bodies meet twice and four times a year respectively to promote and coordinate disaster risk reduction and preparedness activities. The NDMC formulates and reviews disaster management policies and issues directives. The IMDMCC is responsible for implementing these directives, maintaining inter-ministerial coordination and supervising the services of the Armed Forces and NGOs working in disaster management. The Ministry of Disaster Management and Relief (MoDMR) is responsible for coordinating national disaster management efforts across all agencies, while the Department of Disaster Management (DDM) is accountable for coordinating the City Corporation, District, Municipality, Upazila and Union level Disaster Management Committees.

Development Partners: Bangladesh is a country where many innovative and pilot projects related to development are tested. The report by Displacement Solutions and YPSA (2014) also identifies a number of development partners engaged in climate change, disaster, and environment related activities. Development partners directly supported both government organizations and non-government organizations to address climate change and environmental issues in Bangladesh. CDMP established under the MODMR, received support from a number of development partners including UK Aid, the European Union (EU), Australian Aid, Norwegian Embassy, Swedish Embassy and UNDP worked on climate change and migration issues. However, despite the plethora of activities implemented by NGOs, CSOs with support from a large range of development partners, migration was absent in development partners and NGO, CSOs programming. However in the recent years a number of initiatives have emerged to address the MECC issues.



Due to salinity intrusion, acres of land have been converted into shrimp cultivation, which is less labour intensive making thousands of people jobless. Dokhin Bedkhashi, Koyra, Khulna, Bangladesh.

GIZ has incorporated environmental migration into their programming through two avenues: “implement measures that reduce pressure to migrate” and “support migration as an adaptation measure” (GIZ, 2012). GIZ is currently implementing a project titled “Urban management of internal migration due to climate change” which is the first project with German support to address MECC issues. Through the CDMP project, mentioned above, which was supported by multiple donors, UNDP has partially delved into the issue. In addition, the project “Deltas, vulnerability and climate change: migration and adaptation (DECCMA)” developed through the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA) program supported by Canada’s International Development Research Centre (IDRC) and the United Kingdom’s Department for International Development (DFID) covers three deltas the Ganges-Brahmaputra-Meghna (Bangladesh), the Mahanadi (India) and the Volta (Ghana). This particular project aims to examine migration within deltas in the context of climate change, and the extent to which it serves as an effective adaptation strategy (DECCMA, 2015).

Independent Commission for Aid Impact (ICAI, 2011) argued that DFID Bangladesh should incorporate climate change and migration related issues into their programming for the next 20-30 years with particular focus on capacity building activities. Incorporation of MECC issues in development partners programming and policy was also recommended by Siddiqui et al. (2013b).

5.5 STATE OF IMPLEMENTATION OF POLICY AND LEGAL INSTRUMENTS: GAPS AND THE WAY FORWARD TO ADDRESS THE MECC NEXUS IN BANGLADESH

The Government of Bangladesh developed the NAPA in 2005, which was revised in 2009. The NAPA 2005 briefly recognizes migration and suggested a number of immediate actions such as “Promoting adaptation to coastal crop agriculture to combat salinization” which would halt mass scale rural-urban migration. Similar types of action were also suggested for flood vulnerable areas to address migration. It states that, “this would to some extent reduce social problems of migration of the distressed community to cities” (Bangladesh, Ministry of Environment and Forests, 2005). The revised version of NAPA (2009) does not mention climate change-induced migration issues, although it is an extended version of the NAPA 2005 to address both current and immediate and future adaptation options. The revised NAPA covers comprehensive adaptation needs in different sectors and crosscutting areas e.g. gender, livelihoods and institutional arrangements. The Disaster Management Act of 2012 also has a provision to transfer affected people to other regions to resume natural ways of living.

With the increasing frequency of climate change-induced natural hazards and the need for immediate and long-term humanitarian responses, most development interventions that target other areas, such as livelihoods or education include aspects of climate change. At the field level, a wide range of activities is being focused upon, especially disaster risk reduction (DRR) and climate change adaptation (CCA), however human mobility has not been mainstreamed into these activities. These approaches usually focus on building the resilience of affected communities and consider migration as a failure to adapt instead of a possible adaptation strategy. Furthermore, BCCSAP includes an assessment of climate change and its impact on outmigration, but this still remains to be done.

There is a huge dearth of data and information on how climate change and natural hazards, and its improper management impact on migration. This in turn, creates a situation where information sharing between governments becomes challenging, limiting investment in infrastructure, and adversely affecting human and scientific resource management (Asaduzzaman et al., 2013).

To address this gap, climate change modeling activities are gaining pace in Bangladesh. One example is the “Capacity Building in Climate Modeling in Bangladesh” by UK Aid, the Met Office Hadley Centre and the Climate Change Cell at the Bangladesh University of Engineering and Technology (BUET) and another is the “Generation of PRECIS scenarios for Bangladesh: Validation and Parameterization” (Bangladesh, Ministry of Environment and Forests, 2009) building on technical capacities regarding modeling. However the focus of these modeling initiatives are future scenarios of climate, storm surge, salinity intrusion, flooding situations, temperature, rainfall and not so much on how the movement of people will be impacted.

Compared to international and regional policies, Bangladesh can claim to have made more than just a scant mention in its documents. However as pointed out by UNDP (2013) the overall official policy responses have been weak with regards to internal migration, which in Bangladesh is the main type of movement for people whose livelihoods have been affected by natural disasters. The Government tends to focus on addressing the impacts, instead of investing in proactive preparation. The UNDP report also critiques the government’s overall reticence to act on rural to urban flows. The need for internal migration policy was also reflected by Siddiqui et al. (2013b) as at present there is no policy directive regarding internal migration.

IOM (2010a) also highlights that even with the positive steps taken by the Government of Bangladesh in policy on climate change, migration is not mainstreamed in the policies on environment, disaster management and climate change. The tendency is to look at migration from a negative perspective. Policies and strategy documents usually aim to curb internal migration. While in Bangladesh there is the NAPA and BCCSAP, which demonstrates the commitment of the Government to addressing climate change concerns, there is a need to have in place an action plan that addresses the MECC nexus more holistically in Bangladesh. An action plan on MECC would identify multi-sectoral interventions that can address environmental displacement, use migration as an adaptation strategy for affected communities as well as look at other policy requirements for “trapped” populations.

In addition to the above, it would be important to learn about the current linkages and relationships between climate change, environmental degradation and migration at the local level. People’s vulnerability to climate change impacts and their related perceptions; current adaptation strategies, and migration trends need to be captured and documented for community level evidence of the MECC nexus in Bangladesh. This would ultimately help in identifying needs and developing a national action plan which can present migration as a positive adaptation strategy for vulnerable communities, in addition to addressing human mobility in the context of climate change and environmental degradation.

Apart from the national context, at the regional level as well, there is only one very small reference made to migration in the SAARC Social Charter and none in the other SAARC policy documents. Without actual mention and specific actions outlined in policy documents in these regional instruments, it will be difficult to approach and address the MECC nexus from a regional perspective as well as to incorporate it in national level policies and programmes.

5.6 RESULTS OF THE PRIMARY DATA COLLECTION – BANGLADESH

In Bangladesh, climate change and environmental “hotspots” for collecting primary data and information were identified based on the criteria highlighted in the secondary literature and in consultation with the Project Advisory Committee (PAC) (details regarding the approach and methodology are given in the section above). The household survey was conducted in the districts of Khulna (southwest coast), Patuakhali (central coast), Rajshahi (northwest) and Sunamganj (northeast-haor). In addition to the survey, 12 Focus Group Discussions (FGDs), 34 key informant interviews (KIIs) and 4 community workshops (CWs) were conducted to complement and validate the survey findings. Eight of the FGDs were conducted in the four study districts while the rest were held in urban slums of the following four divisions: Dhaka, Rajshahi, Khulna and Barisal. These urban slums located at the division level are well known as destinations for poor migrants. As for KIIs, a total of 24 were conducted in the four study districts. Those interviewed included the Upazila Nirbahi Officers (Chief Executive of sub-district), sub-district Statistical Officer, Chairmen in the selected Union Parishads and three local leaders from each of the selected Union Parishads. The remaining 10 were conducted with senior policymakers, researchers and academics working on climate change, environment and migration issues at the national level. Furthermore, community workshops were held at each of the study districts.

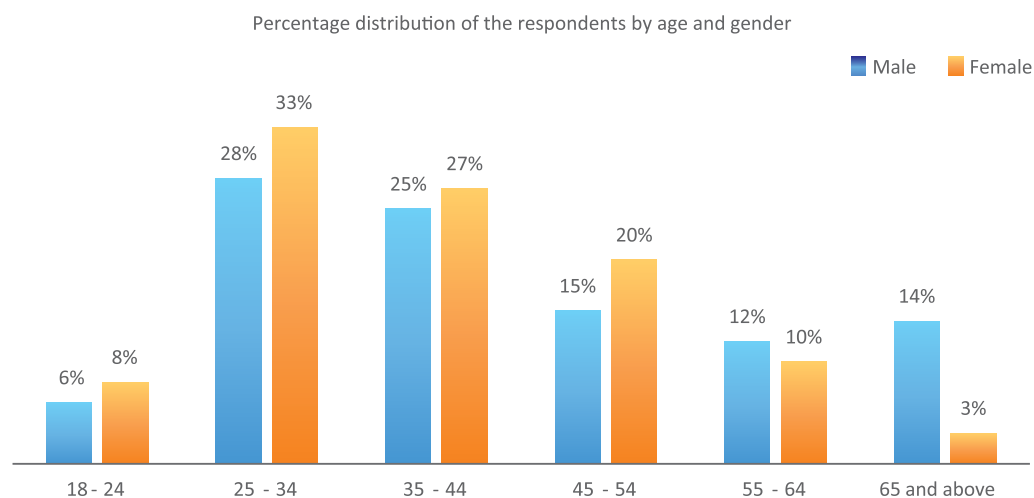
This section provides a detailed overview of the findings of the study. It describes the demographic and socioeconomic profile of the study population, and then illustrates the migration trends amongst the local population. It also provides details on the origin and destination of the migrants, before presenting the perceptions of the study population on the impacts of climate change and environmental degradation on sectors and livelihoods. Then it elucidates how the study households currently adapt to the adverse impacts and provides an overview of the climate change, environmental degradation and migration nexus from the study areas. The final sections of the chapter depict the gender dimensions in relation to climate change and migration issues and provides conclusions and recommendations.

5.6.1 Demographic and socioeconomic profile of the study population

This section provides an overview of the demographic and socioeconomic characteristics of the study population. This mainly includes age, gender, social status, education and primary occupation of the respondents. The household characteristics including household size, assets, major sources of income, monthly income and expenditure, access to basic services e.g. electricity, water supply and sanitation are summarized in this section.

Age, gender and social status

The age of the respondents ranged between 18 and 65 years (Figure 6). The largest group, which consists of nearly 31 per cent of the respondents, is between 25 and 34 years. The smallest representation, of nearly 7 per cent of the participants, were young people under the age of 24.

Figure 6: Percentage distribution of the respondents by age and gender

Out of the total 320 respondents under the household survey in four-study districts, 88 per cent of them were married. A significant majority of the respondents (86%) were born in the study districts and considered these area to be their home districts. Male respondents comprised of 52 per cent of the total respondents, while women represented 48 per cent.

The gender distribution across the study districts is provided in Table 7 below. A total of 80 respondents were surveyed in each of the four districts. The highest participation of women was in Rajshahi, whereas the lowest number was recorded in Patuakhali.

Table 7: The gender distribution in study districts by participation from each household

		Sex		Total Households
		Female	Male	
District	Khulna	36	44	80
	Patuakhali	32	48	80
	Rajshahi	52	28	80
	Sunamganj	35	45	80
Total		155	165	320

Education Levels

In all four districts, it was found that 45 per cent of the participants were educated up to the primary school level (equivalent to class five in Bangladesh). Less than 20 per cent of the total respondents had received a high school level education, while less than three per cent, had undergraduate degrees. Some respondents (1%) especially in Patuakhali and Rajshahi had Madrasa education. A high number of respondents (32%) were found to be illiterate. An advanced education (equivalent to graduate and post-graduate degrees), was attained by less than one per cent of the respondents. Though the status of education

in the study areas does not appear to be high, the illiteracy of the study population is much lower than the national rate of illiteracy which is about 45 per cent (BBS, 2010). The district-wise education levels are given in the table below:

Table 8: Education status of the respondents by study districts

Level of Education	Study Districts				Total
	Khulna	Patuakhali	Rajshahi	Sunamganj	
Kindergarten		0.31%			0.31%
Primary	6.25%	15.63%	6.88%	16.56%	45.31%
High School	4.06%	4.38%	6.56%	2.50%	17.50%
College	0.63%	0.94%	0.94%		2.50%
University	0.63%	0.31%			0.94%
Madrassa-Kawmi		0.63%	0.63%		1.25%
Illiterate	13.44%	2.81%	10.00%	5.94%	32.19%

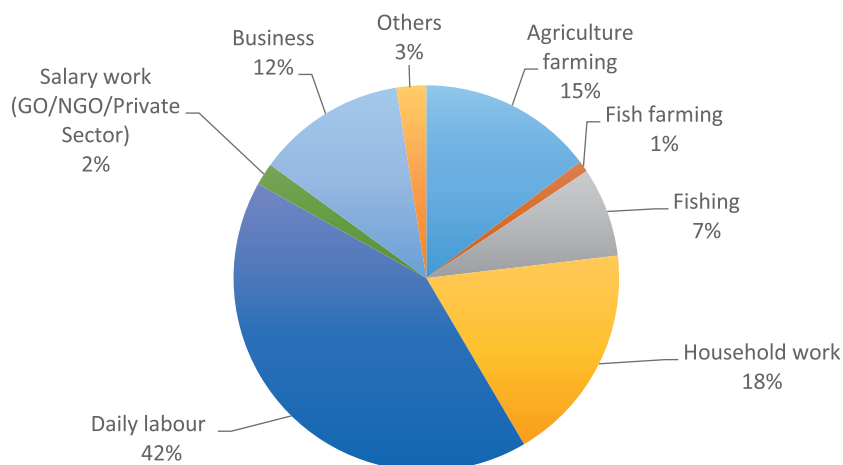
Primary occupation of the respondents

The results of the household survey show that daily labour, for example hired farm labour, earthwork, rickshaw/van pulling and so on, was found to be the most common (42%) primary occupation among the study respondents. The second highest occupation was household work (18%), with the third and fourth primary occupations being in agriculture (15%) and business (12%) respectively. Only two per cent of the respondents were found to be in to be in salary-based work in government offices, NGOs or private sectors. As for secondary occupations, nearly 7 per cent of respondents were found to be involved in fishing. Some of the respondents were involved in livestock rearing (with the highest proportion in Rajshahi), and students were categorized under “others”(three Per cent). The percentage distribution of each occupational category is given below in Figure 7.

In the slums, the FDGs revealed that the common primary occupation for male members was found to be daily labour in the construction and transportation sectors. The other primary occupations for male members include working in small shops, hotels and restaurants, street vending etc. Many female members living in the slums work as cleaners at hospitals, clinics/diagnostic centres, hotels/restaurants, schools/coaching centres and as domestic help. This indicates that livelihoods of the migrants are very different in their origin locations compared to destinations. In their places of origin, people were involved with natural resource based livelihoods, while in the destination, they are more engaged in industrial/mechanized livelihoods.

Figure 7: Percentage distribution of the Primary occupation of the respondents

Percentage distribution of the primary occupation of the respondents



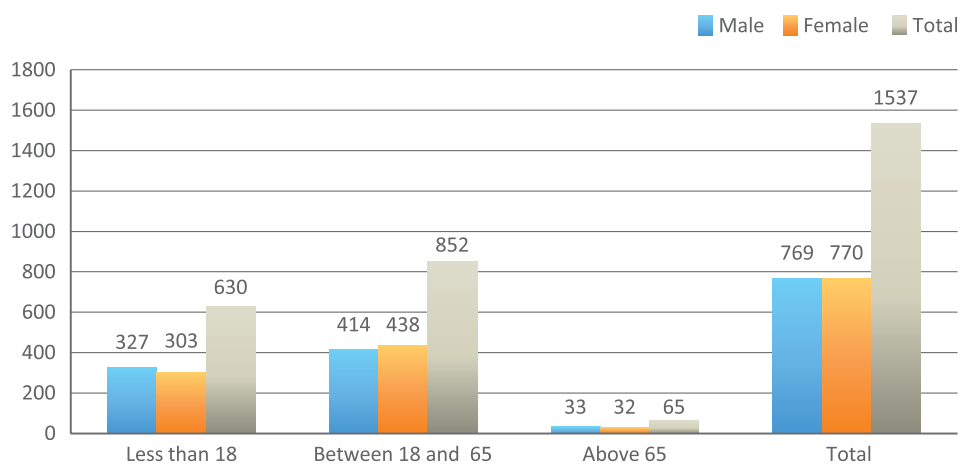
5.6.2 Household characteristics

Household size

Each of the 320 households had an average 4.8 members. This average size of each household is slightly larger than the national average, which is 4.5 (BBS, 2010). Figure 8 below shows that the gender distribution in total households is almost equal as female members accounted for a total of 770 while 769 were male members. There were total 630 members in these 320 households who were younger than 18 years. The highest number of household members falls under the age bracket of 18 and 65 years, consisting of 852 individuals, of whom 438 are female. For reference, Table 7 above also indicates gender distribution by age in each household of the study areas.

Figure 8: Gender distribution of household members by age

Gender distribution of household members by age



Major sources of income

Most of the study households have multiple sources of income throughout the year. The major sources of income varied according to study district. Overall, the most important source (50%) of income was found to be farming, followed by non-farm daily labour (49%). The non-farm daily labour mainly includes earthworks, ghatsromik (working at local small river port), van/rickshaw pulling, working in brickfields, working in small shops, restaurants in local market, etc. Many of them depend on field-based daily labour (39%). The other major sources of income include fishing (28%), small businesses such as small shops, restaurants, tea stalls (25%), internal remittances (27%) and international remittances (5%). On the other hand, most of the study households (64%) have only one earning member while about 25 per cent are double income households. The study indicates that a single earning member among non-migrant households is higher (72%) than that of migrant households (57%) implying that multiple earning members were found in about 43 per cent migrant households, while it was only 28 per cent among the non-migrant households.

Table 9: Major sources of income by study district

Major income sources	District				Total
	Khulna	Patuakhali	Rajshahi	Sunamganj	
Farming	41.3%	32.5%	61.3%	65.0%	50.0%
Other non-farm daily labour	65%	31%	55%	45%	49.2%
Field-based daily labour	50.0%	11.3%	47.5%	46.3%	38.8%
Fishing	45.0%	37.5%	2.5%	28.8%	28.4%
Internal remittances	46.3%	12.5%	28.8%	18.8%	26.6%
Small business	11.3%	36.3%	25.0%	28.8%	25.3%
International remittances	9%	0%	9%	1%	5%

As mentioned in the FGDs, the major sources of income of the households at the destination include daily labour, small business (mainly street vendors) and private service e.g. domestic help.

On the major sources of income of migrant and non-migrant study households, the study indicates key differences. Most of the non-migrant households (61%) earn from agriculture while majority of the migrant households (60%) depend on non-farm daily labour followed by farm based daily labour (51%). Non-migrant households are also more engaged in local level small business enterprises. Fishing seems to be the second largest income of the migrant households in the study areas. The details are given in the following table.

Table 10: Major sources of income by type of study households

Main income source	Migrant households	Non-migrant households
Farming	39.4%	60.6%
Fishing	39.4%	17.5%
Business	16.9%	33.8%
Farm based daily labour	50.6%	26.9%
Non-farm daily labour	60.0%	36.3%
Internal remittances	58.1%	0.0%
International remittances	9.4%	0.0%

Level of income and expenditure of study households

The average monthly income per study household is 8,971 Taka (equivalent to USD 112) with highest in Patuakhali (10,438 Taka or USD 130) and lowest in Khulna (5,746 Taka or USD 72). The average income of the study population in Khulna (southwest coast) is 45 per cent lower than the monthly income in Patuakhali, and 36 per cent lower than the total average among the four study districts. The mean expenditure of the study population on the other hand, was found to be slightly lower than the mean income. The expenditure was found to be very close to the income levels in Khulna (details in Figure 9). Overall, 56 per cent of the study households had some savings, with highest in Rajshahi (72%) and lowest in Khulna (19%).

Regarding mean income and expenditure between migrant and non-migrant households, the study indicates that both monthly mean income and expenditure of the non-migrant households is higher than that of the migrant households. It indicates that monthly mean income of the non-migrant households is about 9,358 Taka or 117 USD while it is only 7,998 Taka or 107 USD for migrant households. The details are given in Figure 10 below.

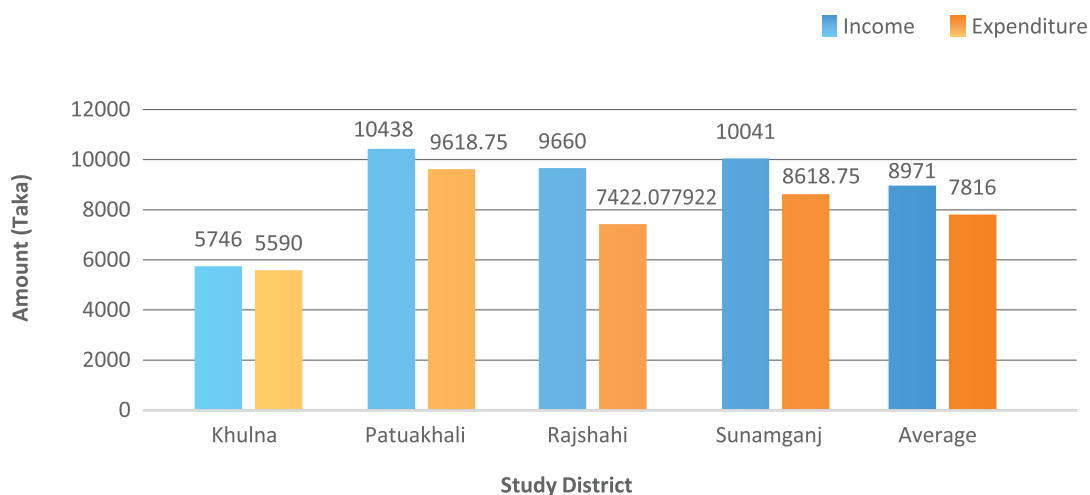
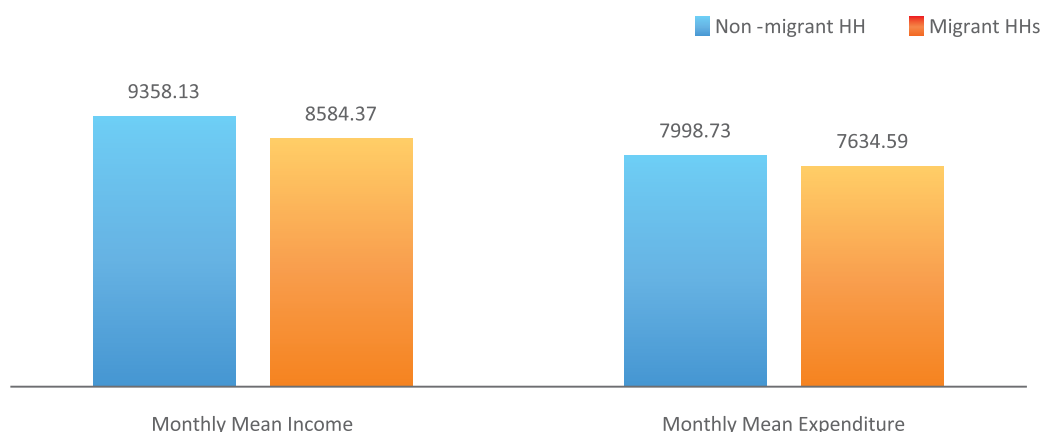
Figure 9: Average monthly income and expenditure of the study households by districts

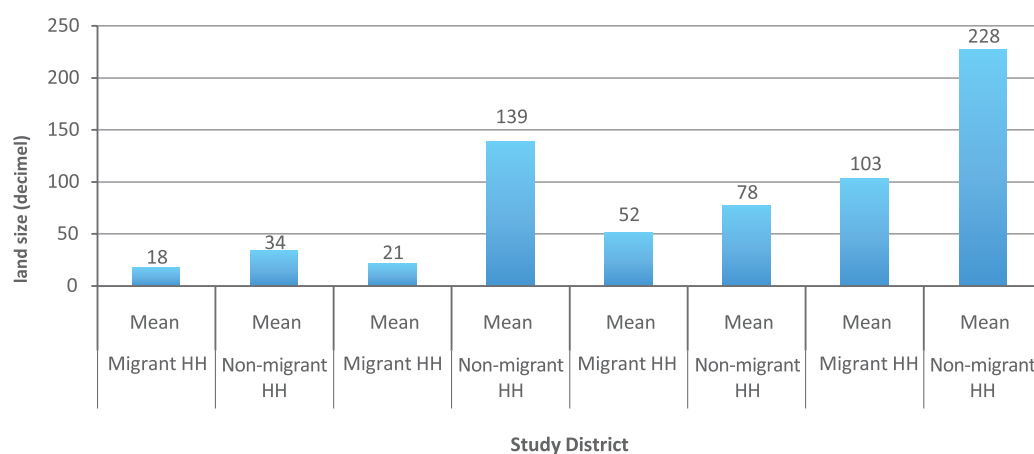
Figure 10: Monthly mean income and expenditure of migrant and non-migrant study households



Property ownership

The survey revealed that greater numbers of non-migrant households had land ownership in all four-study locations. The non-migrant households in Sunamganj on an average owned around 228 decimals (equivalent to 99,296 square feet) of land compared to 103 decimals (equivalent to 44,857 square feet), the average of land owned by all migrant households. In Patuakhali, the surveyed non-migrant households owned roughly 139 decimal (equivalent to 60,536 square feet) of land per household while the migrant households owned only 21 decimals (equivalent to 9,146 square feet). In Khulna, very few households owned land and amongst the ones who do, the average size is 34 decimals (equivalent to 14,807 square feet), for non-migrants and only 18 decimals (equivalent to 7,839 square feet), for migrant households, please see Figure 11 for detail.

Figure 11: Average land owned by migrant and non-migrant households by district



Rajshahi has a comparatively better situation than the other three districts as the gap of land ownership between the migrant (52 decimals, equivalent to 22,646 square feet), and non-migrant (78 decimals, equivalent to 33,970 square feet), households is not as significant. The study indicates that migrant households have less land size than the

non-migrant households in the project locations. This finding was also reinforced by the policymakers who mentioned that people who are landless are more prone to migration. According to the ANOVA test, this relationship is significant in all study locations. Of all the respondents, 98 per cent of them said that they owned a house on their own land. This percentage was found to be the highest in Rajshahi, where all respondents owned a house, while the lowest was found to be in Sunamganj where 96 per cent said they owned a house (details in Figure 12). In contrary, all the respondents in FGDs mentioned that they pay rent to live in the slums at the division level (on monthly basis in Barisal, Khulna and Rajshahi, and on daily basis in Sylhet).

The study indicates that respondents use their own land mainly for housing purposes. Around 36 per cent of households used their land for crop cultivation, whilst 22 per cent said they use them as sources of water (for e.g. ponds, domestic water including for drinking) and 6 per cent said they lease the land for agricultural production. Around 7 per cent of the study households said their lands remained fallow while only 4 per cent rear livestock on their own lands.

Figure 12: Percentage distribution of having a house on own land by district

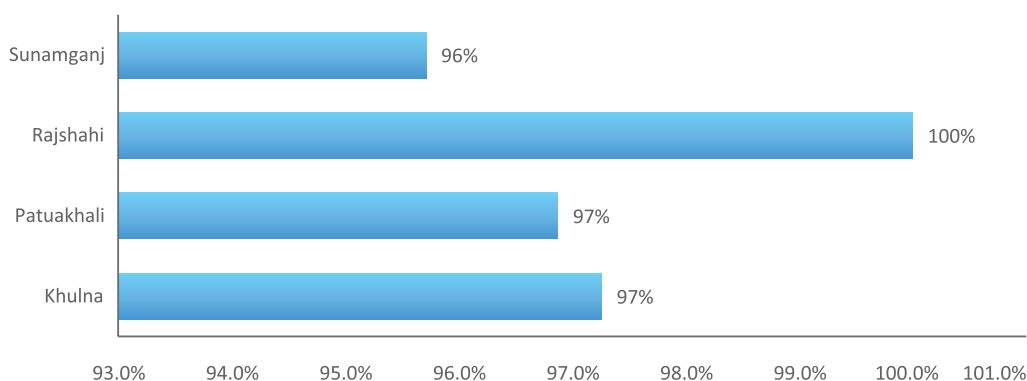
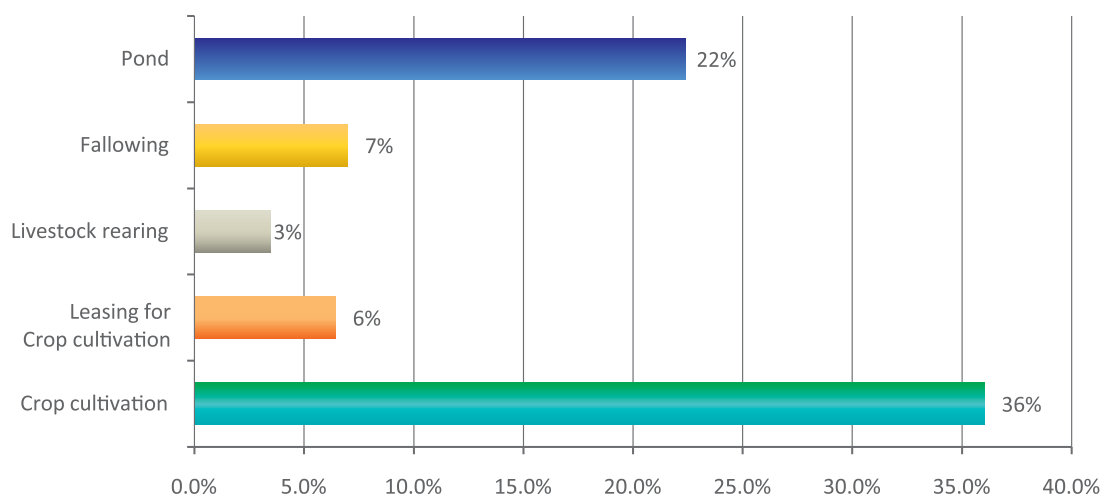


Figure 13: Percentage of households using own land for different purposes



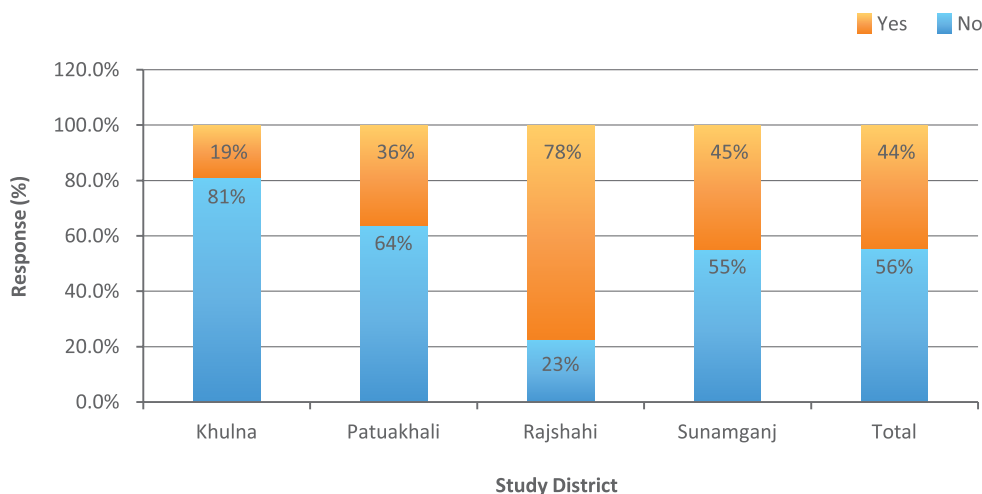
Household assets

The study examined the ownership of household assets including televisions, mobile phones, bicycles, motorbikes, vehicles, refrigerators, fishing nets, boats and tractors among the study households, primarily to have a practical understanding on the socioeconomic status of the study population. Over the years, the ownership of mobile phones has increased and now, many families in suburban and rural areas of Bangladesh consider this as an important household asset. The following table indicates that at least 92 per cent of the households surveyed for this research possessed at least one mobile phone. All of the respondents in Patuakhali, 83 per cent in Khulna, 88 per cent in Sunamganj and more than 97 per cent of respondents from Rajshahi mentioned that they own at least one mobile phone. Among other items that the households consider assets, a total of 38 per cent of the respondents own a fishing net, the highest proportion in Khulna where more than 61 per cent own this, followed by Sunamganj, with 52 per cent of the respondents owning a fishing net. The high proportion of fishing nets, does not necessarily indicate that many of them own a boat, as only a little more than 12 per cent of total respondents said that they own their own boats. Next, more than 18 per cent of respondents owned a bicycle including around 49 per cent in Rajshahi; further, despite only about 6 per cent of total respondents owning a motorbike; very few (more than 3% in total) owned a basic television. No one owned a television in Patuakhali. Finally, only one percent of the respondents owned a computer and very few owned a refrigerator (in Khulna, none owns one).

Table 11: Household assets in the study areas

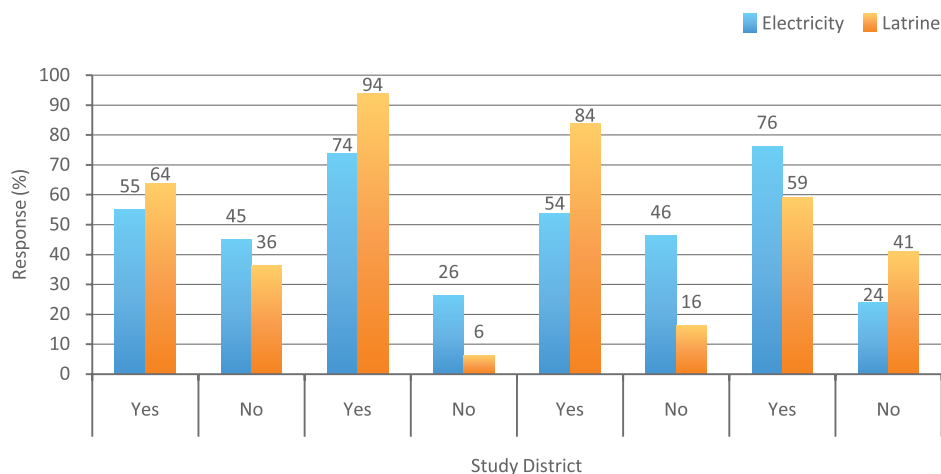
	Khulna	Patuakhali	Rajshahi	Sunamganj	Total
Mobile phone	82.9%	100.0%	97.3%	87.7%	92.1%
Fishing net	61.4%	20.5%	18.7%	52.1%	37.8%
Bicycle	15.7%	2.7%	49.3%	4.1%	18.2%
Boat	14.3%	17.8%	0.0%	17.8%	12.4%
TV with dish connection	1.4%	4.1%	26.7%	2.7%	8.9%
Motorbike	5.7%	6.8%	5.3%	5.5%	5.8%
Only TV (without dish line)	7.1%	0.0%	5.3%	1.4%	3.4%
Refrigerator	0.0%	2.7%	8.0%	2.7%	3.4%
Tractor	0.0%	0.0%	1.3%	5.5%	1.7%
Vehicle (e.g. car)	1.4%	0.0%	2.7%	1.4%	1.4%
Computer	0.0%	0.0%	2.7%	1.4%	1.0%

The responses also indicated the status of the financial savings in each household. The fewest number of people who can manage savings from their earnings were from Khulna, where around 81 per cent mentioned that they had no savings. Respondents from Patuakhali and Sunamganj have a similar situation in terms of savings as 64 per cent and 55 per cent respectively expressed that they are unable to save any proportion of their income. On the other hand, the highest number of respondents who said they had some form of savings was from Rajshahi (78%).

Figure 14: Percentage distribution on savings of the households among the study areas

Access to utility services (e.g. energy, sanitation and health)

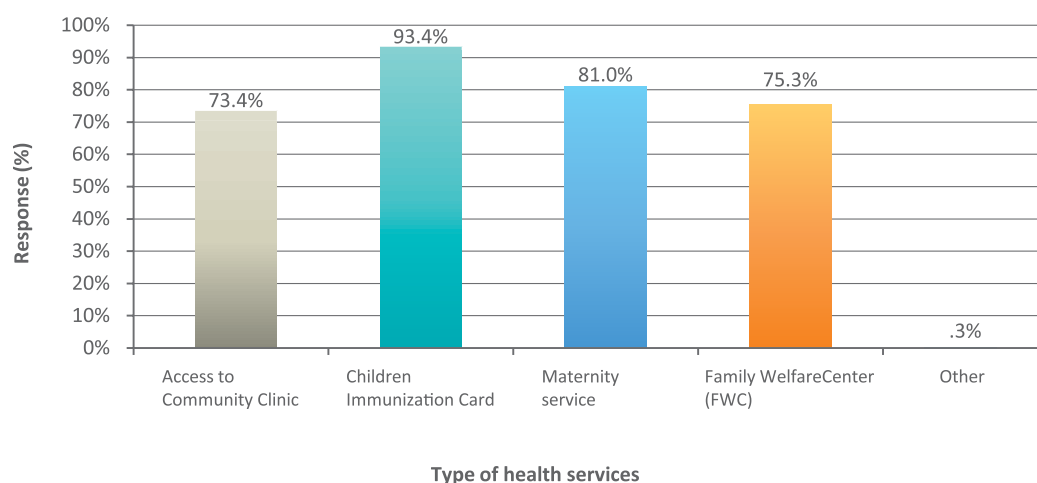
The study was also designed to understand the state of access to some key utility services of the study communities. Most of the study households have access to both electricity (65%) and latrines (75%). In terms of access to electricity, Sunamganj was found to have the highest access (76%) while Rajshahi was the lowest (54%). Of those households who had access to electricity, only 34 per cent were covered by the national grid and the rest had access through solar power. According to the FGDs, KIIs and community workshops, many of the households had access to the national grid before Cyclone Aila damaged these connections in 2009. These are yet to be re-established and until then, households depend on solar power. Regarding sanitation, 94 per cent of the study households had access to latrine in Patuakhali while only 59 per cent had access in Sunamganj. Figure 15 gives more detail regarding the utility services among the study districts.

Figure 15: Percentage distribution of access to electricity and latrines by district

In the urban areas, most of the households have access to improved sources (e.g. deep tube well, shallow tube wells, deep set pump) for drinking water. Some households use ponds (if available) for domestic purposes, especially in the slums of Sylhet. Participants

in all of the FGDs mentioned that access to latrines is inadequate. In every slum people share the toilets. Access to health services is better than at the places of origin, although it is expensive. However, people can avail health services when needed. The people living in the slums of Barisal and Sylhet do not have access to electricity.

Figure 16: Percentage distribution of access to health services at Union level in study locations



The Government of Bangladesh has established one Community Clinic for every 6000 people in rural areas to ensure basic health services at the Union Parishad (BMRC, 2011). Of the total study households, 74 per cent avail the health services at the Community Clinic, including a 100 per cent of the respondents in Rajshahi. More than 95 per cent households received health services from Community Clinics in Patuakhali and Sunamganj. According to FGDs, KII and Community Workshop, there is a Community Clinic in Khulna Union Parishad, but the health assistant is available only one day a week (Wednesday). Therefore, the respondents in Khulna cannot avail of the Community Clinic facilities properly. Depending on the gravity of the health problem, people in Khulna visit the Upazila Health Complex located at Koira Upazila, which is about 20 km from the study villages. Overall, more than 80 per cent of households enjoy access to maternity and child immunization services. A small portion of respondents relied on health professionals without any formal qualifications or alternative medicine for their health services. Details of the health services are given above (Figure 16). Access to electricity and sanitation are not factors influencing migration, as indicated by most of the participants in FGDs and community workshops. However, some people temporarily internally or externally migrate for health treatment.

Sources of drinking water

None of the respondents said they had access to surface water, with 51 per cent stating that they use shallow tube-wells while the rest said they use deep tube-wells. The highest number of respondents who use shallow tube-wells was in Rajshahi at 99 per cent and the highest number users of deep tube-wells were Khulna (99%). The study indicates that almost the entire study population had access to improved sources of drinking water. But in some locations, especially in Patuakhali and Sunamganj, the tube-wells are located in distant places. Most of the households use surface water for domestic purposes as mentioned in the FGDs.

5.6.3 Migration trends in the study areas

When surveyed about their migration status, nearly 60 per cent of respondents mentioned that when migrating internally, the migrants returned to their home districts or base after sometime, usually between one week to eight weeks. In some cases the migrants return after 12 to 24 weeks or 6 months as mentioned in most of the FGDs. On the other hand, nearly 30 per cent of the respondents mentioned that at least one household member had migrated, but had not yet returned. Figure 17 considers these people to be current migrants. A very small number of the respondents (only around 4%) mentioned that their households consist of people who were currently away as international migrants, while approximately 8 per cent responded that the members who migrated internationally have returned to their home. Figure 17 shows these numbers corresponding to the migration status.

According to participatory discussions with the study population, internal migration is more common as an impact of both climatic and non-climatic factors. Seasonal internal migration takes place because of a number of reasons including lack of local level livelihood opportunities especially from early monsoon to post-monsoon; degradation of natural resources; to meet the household's current needs, such as the cost of household's daily supplies, education, utility services, and health treatment, amongst others. Many of the respondents in urban slums mentioned that weather/climate change-induced disasters and environmental problems affect natural resources, reducing livelihood opportunities and sources of income in the areas of origin. In some cases, especially in Khulna and Patuakhali, lives are also under threat because of extreme events like cyclones and storm surges.

Figure 17: Migration trends from the study households

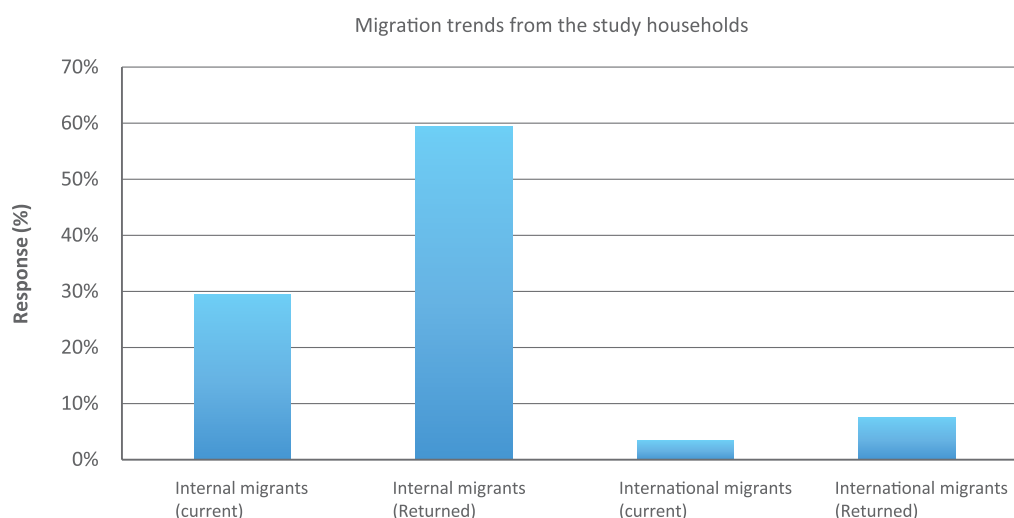
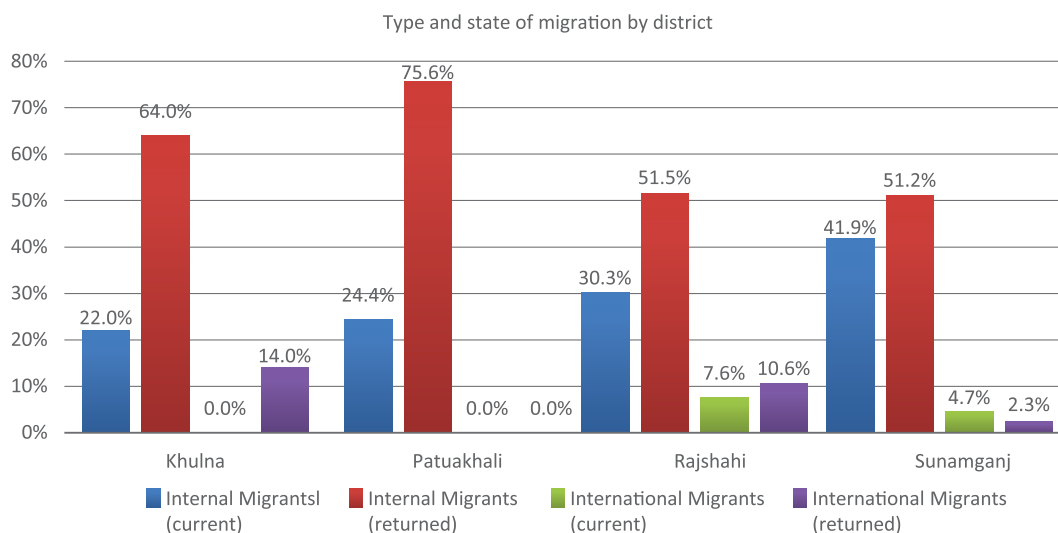


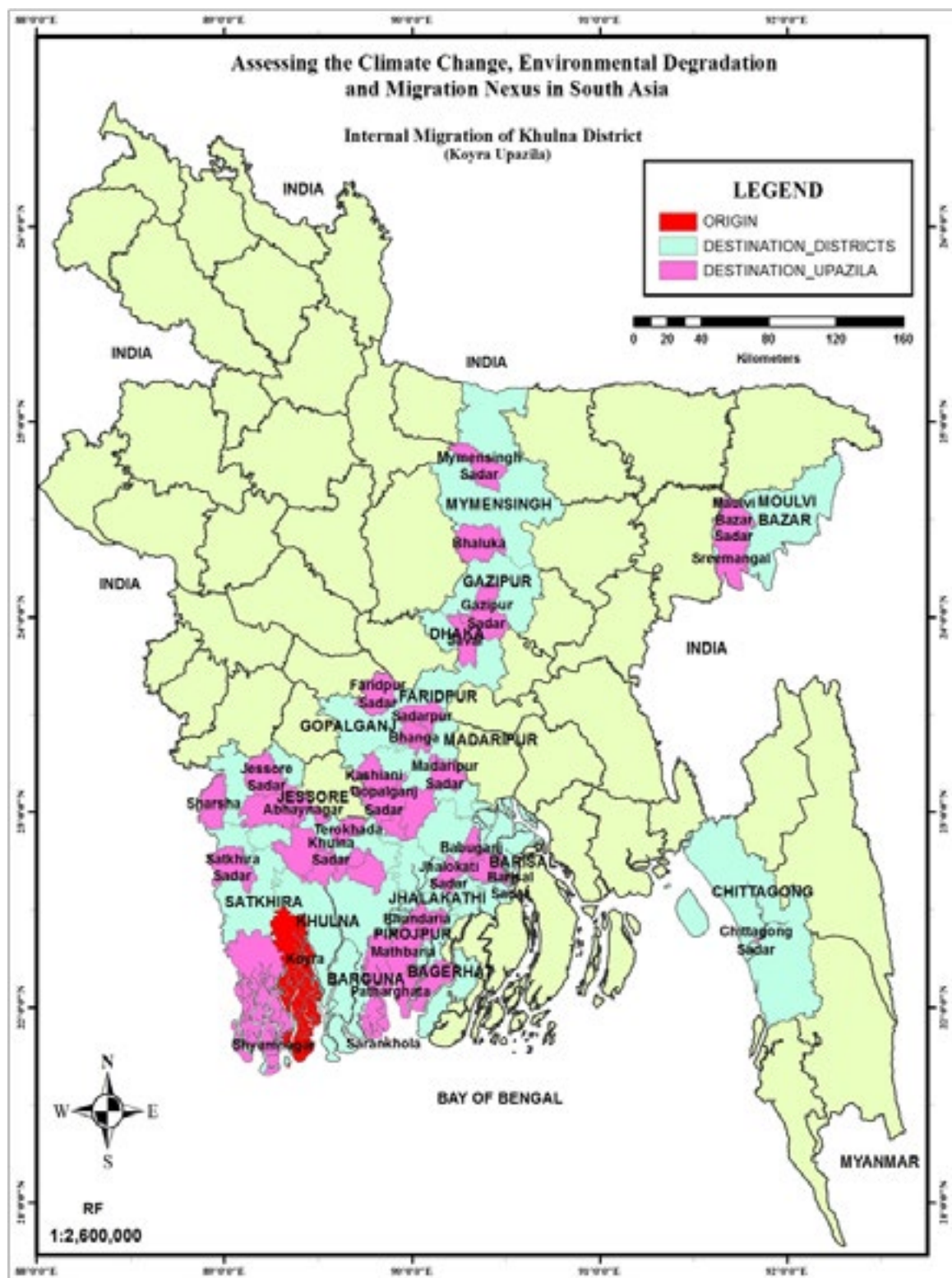
Figure 18 below, depicts migration status by study location. The highest number of respondents from Patuakhali (nearly 76%) mentioned migrating internally and then returning home again; this has been mentioned by at least 64 per cent respondents in Khulna and approximately 51 per cent in both Rajshahi and Sunamganj. 42 per cent of the respondents are currently internal migrants in Sunamganj, while the numbers for this are around 30 per cent in Rajshahi, 24 per cent in Patuakhali and the lowest (22%) in Khulna. The highest number of international migrants who have returned to their home districts can be found in Khulna with around 14 per cent of the respondents, while in Rajshahi, the

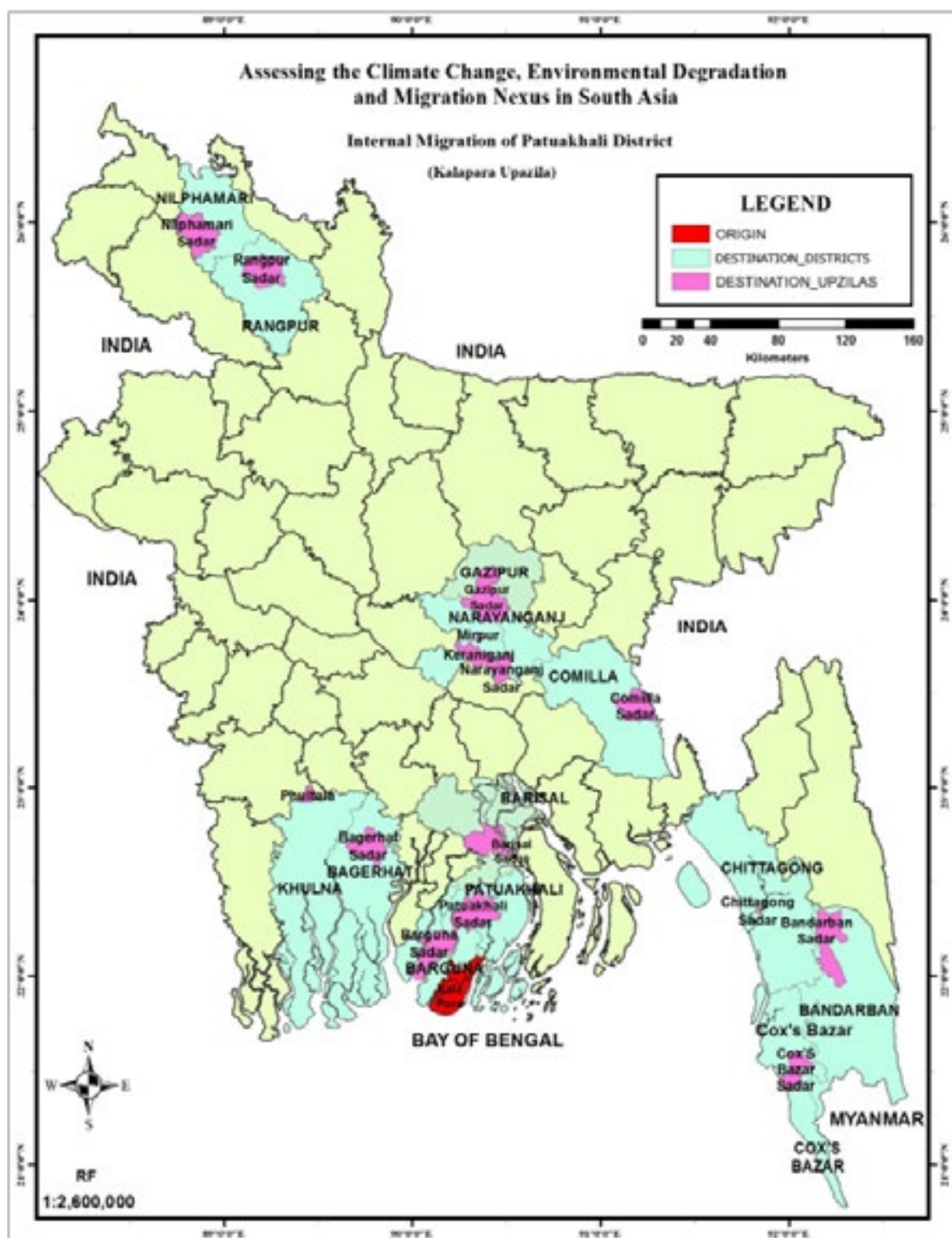
number is around 11 per cent and in Sunamganj, it is slightly more than 2 per cent. The current international migration is more evident in Rajshahi (nearly 8%) and Sunamganj (nearly 5%) as per the study respondents.

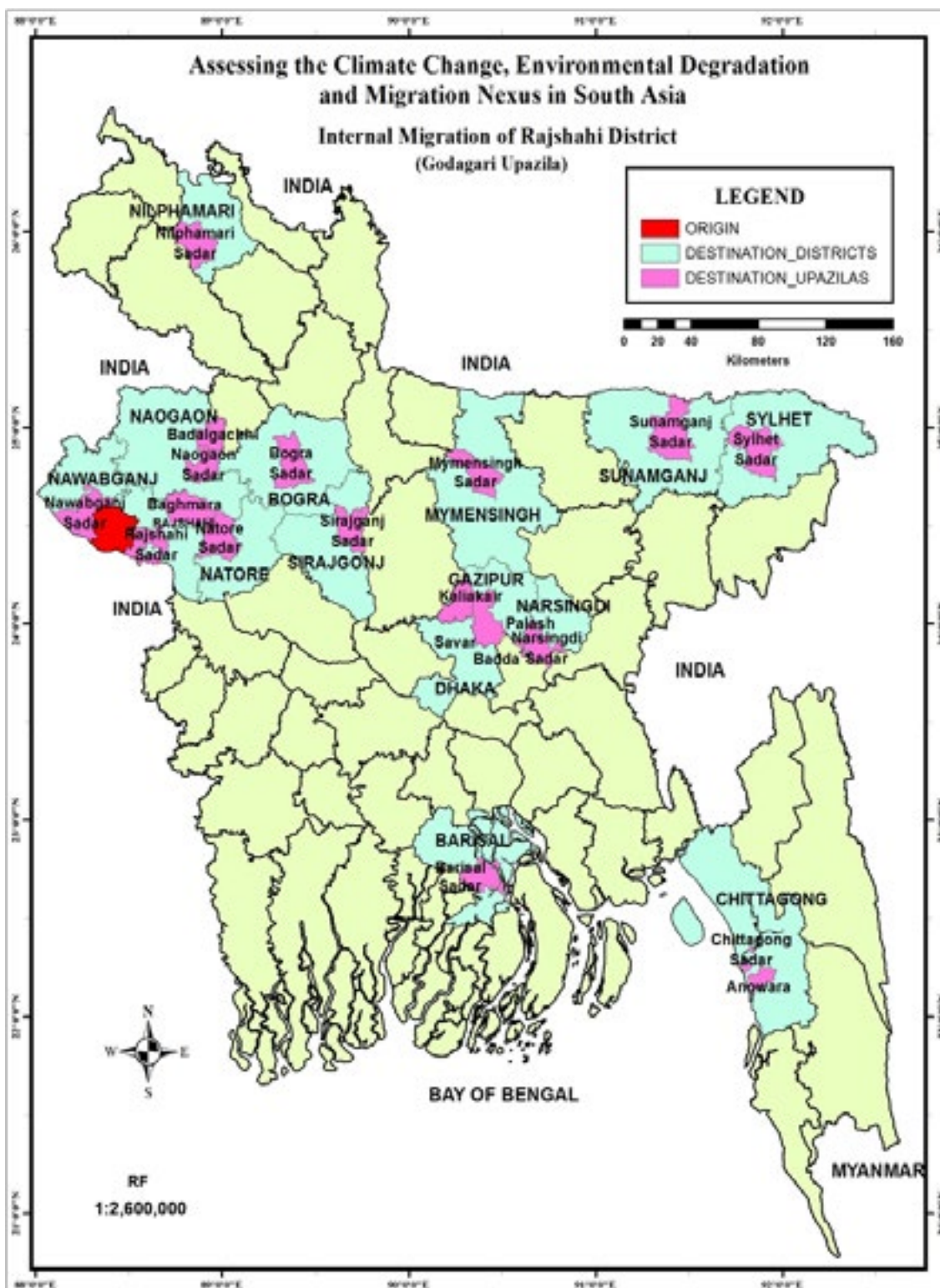
Figure 18: Migration trends from the study households

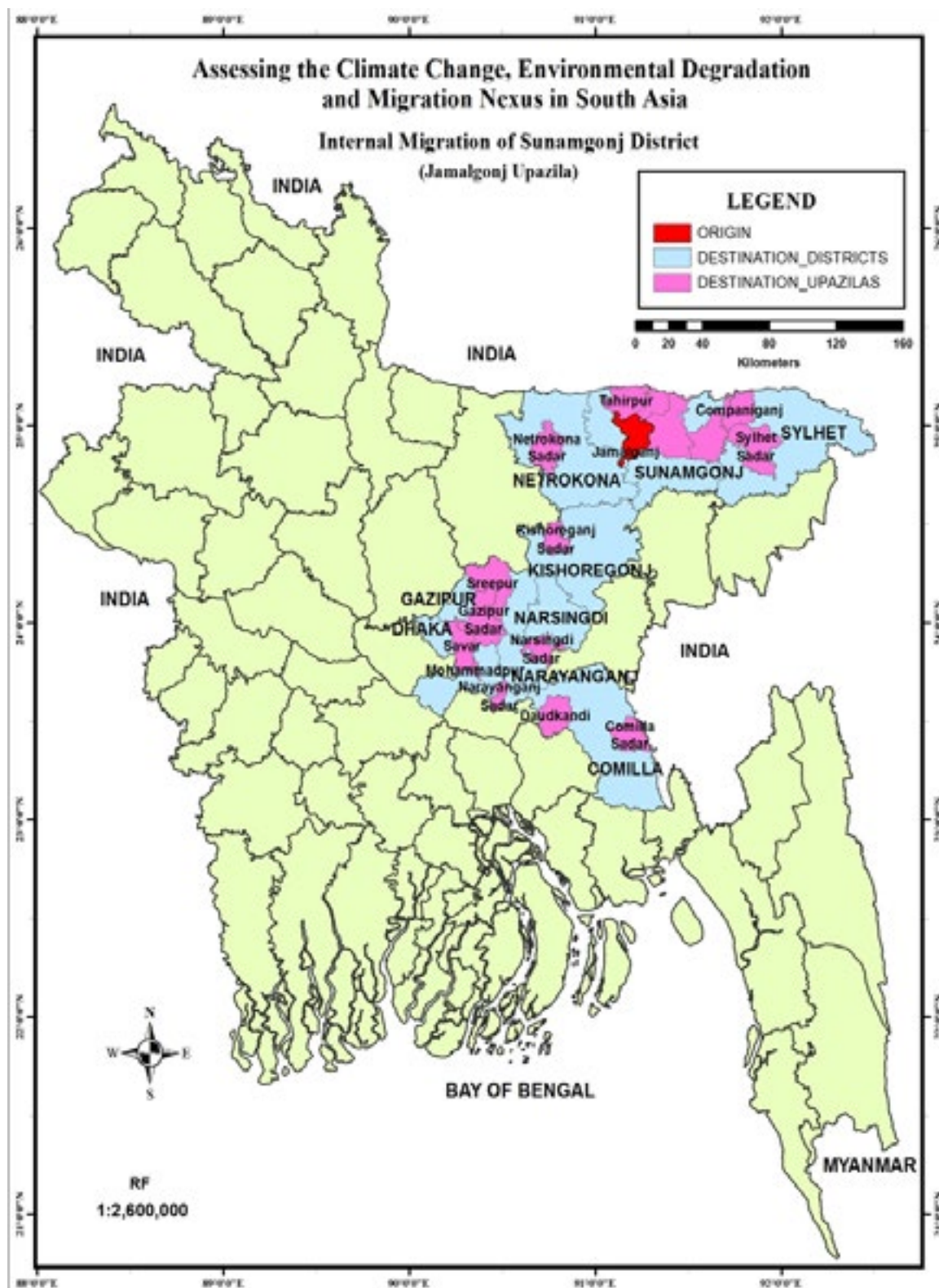


The following maps show details of the origin and destination of internal migrants from the study areas. It indicates that the destinations of internal migration from the study areas are 35 out of 64 districts. The most common destination is Dhaka. Some people also migrated abroad especially from Rajshahi, Khulna and Sunamganj to Saudi Arabia, UAE, Qatar, Jordan, India, Libya and Iraq. According to FGDs and community workshops in all the study locations, international migrants are mostly from middle income households to rich households. However, many poor and lower middle income households take loans either from rich neighbours/friends/relatives or from NGOs for international migration, as stated during the group discussions. These people are mainly farm and non-farm based daily labourers in their areas of origin. It was also reported that mainly male members (between 18 and 40 years) migrate, internally or internationally. This was also reflected in interviews with policymakers where Abdul Qayyum, the head of CDMP of the MODMR said that “only able bodied men usually migrate first, and at a later stage the family might follow as well.”









5.6.4 Climate change, environmental degradation and associated impacts on sectors and livelihoods in the study areas

Bangladesh ranked sixth on the 2016 Climate Risk Index (Kreft et al., 2016). It indicated that in the last 20 years, Bangladesh has been one of the 10 countries most affected by climate change. The country is vulnerable to a number of climate-induced hazards, including annual and seasonal variations in temperature and rainfall, cyclones and storm surges, drought, salinity intrusion, floods and other events such as landslides caused by excessive rainfall in a short period. Another report states that climate change would cause increase risks of floods, cyclones, drought, and sea-level rise in future (World Bank, 2013).

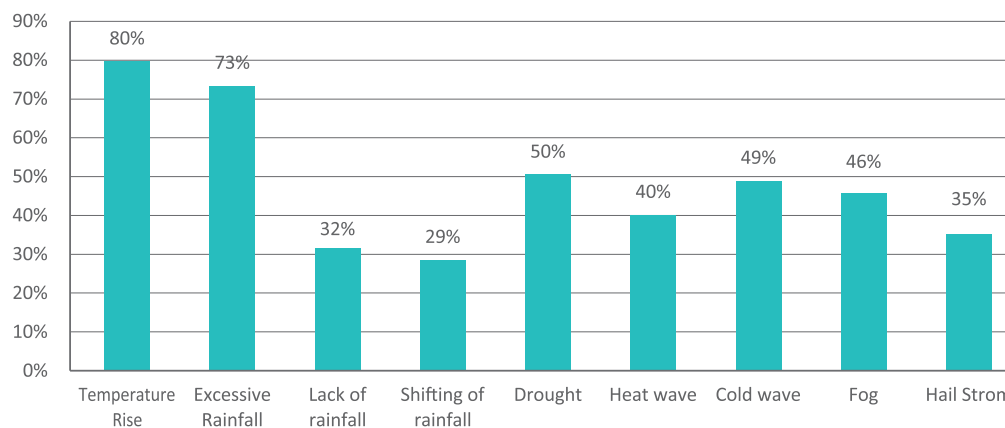
The household survey also explored the climate change impacts on various sectors and livelihoods of the study population. Most respondents mentioned that weather, extreme events and environmental hazards affect key sectors including agriculture, water, health, fisheries, forestry, livestock, and infrastructure. They also mentioned that sector-based livelihoods are severely challenged by climate change. Many of the participants in the FGDs and community workshops said that climate change increases physical and mental pressure on both men and women. In most cases in rural Bangladesh, women are responsible for looking after the family, cooking, washing, taking care of children and other household chores. Climatic variations and the resultant impacts directly affect their lives. In cases of disasters, such as cyclones, droughts and floods, water for household use becomes a challenge to obtain. Not only is there a lack of usable and safe water, but in many cases, especially in the coastal and drought prone zones, women must travel long distances to get water.

Nearly 80 per cent of the respondents thought that temperature rise affected their natural resource-based livelihoods with the highest claim coming from Sunamganj (96%) and the lowest from Khulna (56%). Further, 93 per cent of the respondents claimed that temperatures had risen over the last 15 years whilst 3.7 per cent said they had decreased. About 73 per cent of the respondents thought that excessive rainfall had the most intense impact, with the highest number of respondents from Sunamganj (98%) making this claim and the lowest from Khulna (54%). Eighty-nine per cent of the respondents agreed that excessive rainfall had increased over the last 20 years, which was the highest in Patuakhali (95%) and lowest in Rajshahi (76%). During the FGDs, it was revealed that the rainfall patterns in the study areas have become very erratic, leading to an even greater challenge in securing sufficient water. On an average, 51 per cent of respondents said that droughts have been on the increase over the last 10–15 years, with some years being worse than the others. The highest number of responses for this came from Sunamganj (90%). Figure 19 indicates the perception of the study households regarding the effects of rainfall patterns, drought, heat waves, cold waves, fog and hailstorms.

The temperature rises perceived by the study population are supported by scientific evidence. Syed and Amin (2016) indicate the average maximum temperature of the country has increased in pre-monsoon by 0.016°C per year, in monsoon by 0.034°C per year, in post-monsoon by 0.018° and in winter by 0.015°C between 1978–2007. Their research also indicates that the average temperature of the Barisal region (which covers Patuakhali study district), Rajshahi and Sylhet (which represents Sunamganj study district) region was found to be increasing over the period of 1978–2008. This is expected to continue. The predictions are that Bangladesh will experience an increase of 1.5°C by 2050 (World Bank, 2013). Regarding rainfall pattern, the most recent report indicates that the average

rainfall may increase by 3.3 mm per year in monsoon and 8 mm per year in post-monsoon in Bangladesh (Syed and Amin, 2016). The same report indicates a negative trend in both winter and pre-monsoon.

Figure 19: Climate change related hazards that affect study locations according to respondents



According to 41 per cent of the respondents, the declining ground water table is intensifying their problems. Freshwater scarcity and water pollution were reported to be increasing in the study areas. About 29 per cent of all participants agreed that freshwater scarcity has been on the rise, affecting people in those areas. River bank erosion, arsenic contamination and earthquakes also affect people as mentioned by 20 per cent, 13 per cent and 16 per cent of the respondents respectively.

Figure 20: Other environmental concerns that affect the study locations according to respondents

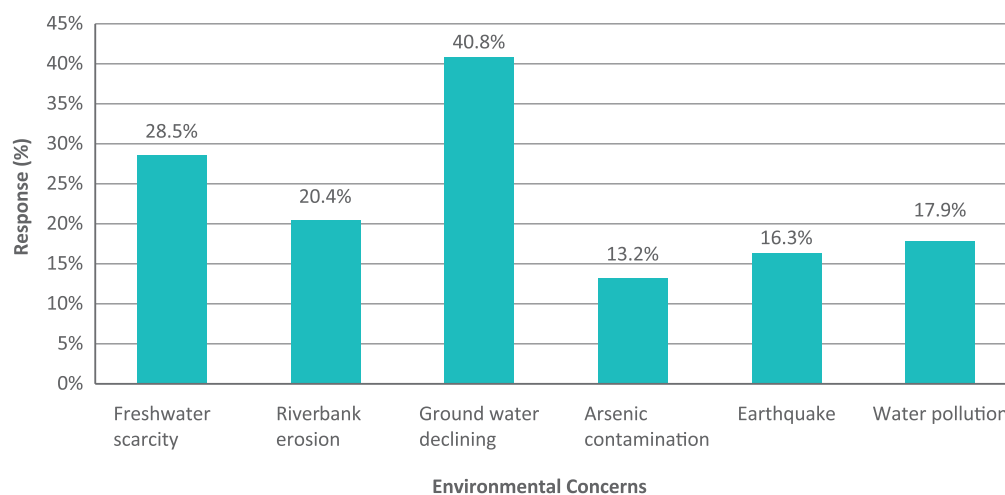


Table 12 below displays the findings on eco-zone specific vulnerability based on the responses of the study populations to different climate change and environmental concerns. The variables of climate change are grouped in four vulnerability classes in this table, based on the levels of impact these variables have on the respondents' lives and livelihoods.

Vulnerability class V1 is the top group of climatic concerns in which the study found that some of the variables have impacted more than 80 per cent of the respondents in the study locations. In this group or class, cyclones, storm surges, salinity intrusion in both water and soil altogether averaged more than 95 per cent of responses in Khulna. Similarly in Patuakhali, cyclones, storm surges and salinity intrusion in water, along with temperature rise altogether averaged more than 94 per cent of the responses from the participants - of them storm surges were universally identified to be affecting the lives and livelihoods for every respondent in Patuakhali. The majority of the respondents felt that their households suffered from a lack of fresh water supply and salinity intrusion in the coastal areas. In Khulna, 98 per cent of the participants felt that salinity in water is an issue that has been on the rise for some time, especially after Cyclone Aila. During the FGDs, KIIs and community workshops, most of the participants in Khulna and Patuakhali mentioned that cyclonic events primarily affect agriculture crops, water resources, fisheries and livestock, infrastructure and communications. Movement of people becomes really challenging immediately after cyclones strike. Only the coastal districts of Khulna and Patuakhali appeared to be affected by this, as other districts did not report similar issues. Despite Bangladesh's tropical location, in Rajshahi, cold waves were mentioned the most among the respondents as more than 91 per cent said that this was the biggest concern for their households. Cold waves have devastating impacts on crops which in turn adversely affect the agrarian households. In Sunamganj, an average of nearly 92 per cent of the respondents identified a longer list of variables consisting of temperature rise, excessive as well as shifting rainfall, floods, declining of ground water, cold waves, fog and hail storms as the top concerns and thus, these eight issues were grouped under V1 for Sunamganj.

The next group or class, V2, consists of some of the climatic and environmental variables that were identified by at least 50 per cent to 79 per cent of the respondents as the main factors for increasing vulnerability in their households. In Khulna, these concerns are temperature rise, excessive rainfall and water pollution, which were mentioned by an average 53 per cent respondents, while in Patuakhali, excessive rainfall, salinity intrusion in soil and scarcity of freshwater were identified by an average 66 per cent of respondents. In Rajshahi, greater numbers of variables were identified by the respondents as V2 class or the second most important climate change and environmental concerns affecting their lives. An average of nearly 68 per cent of the respondents in Rajshahi identified temperature rise, excessive rainfall, tornados or "nor'wester", drought, declining ground water, heat wave and fog as important factors affecting their lives and livelihoods. The participants (around 49%) from Sunamganj identified lack of rainfall, heat wave and freshwater scarcity as important factors affecting their households.

In the third most important climatic and environmental concerns (V3, between 30–49 per cent of the respondents) were drought, riverbank erosion and heat wave in Khulna; hail storm, earthquake and lack of rainfall in Rajshahi; and arsenic contamination and riverbank erosion in Sunamganj. There was no mention of any variable in this category from Patuakhali.

Less than 29 per cent of the respondents identified some additional concerns that are affecting their households and these were categorized as V4. In this group, fog, hail storms, sea-level rise, shifting of rainfall, riverine floods and water-logging were identified by the respondents from Khulna. Heat waves, cold waves, fog, hail storms, sea-level rise, lack of rainfall and water-logging were also mentioned by participants from Patuakhali. In Rajshahi, shifting of rainfall and freshwater scarcity were identified by Rajshahi participants. There was no additional variable categorized from Sunamganj study location.

Table 12: Eco-zone specific vulnerability based on the responses of study households to different climate change and environmental concerns

Vulnerability Class (based on response)	Southwest Coast (Khulna)		Central Coast (Patuakhali)		North West (Rajshahi)		South East (Sunamganj)	
	Hazards	Response (%)	Hazards	Response (%)	Hazards	Response (%)	Hazards	Response (%)
V1 (>80 %)	Salinity intrusion in water	97.5	Storm surge Cyclone	100.0%	Cold wave	91.1%	Excessive rainfall	97.5%
	Cyclone	96.3%	Cyclone	97.5%			Temperature rise, fog	96.3%
	Storm surge	95.0 % 97.5%	Temperature rise	95.0%			Temperature rise, fog	96.3%
	Salinity intrusion in soil	92.5%	Salinity intrusion in water	85.0%			Cold wave	95.0%
							Ground water declining	93.8%
				Flood	87.5%			
				Hail Storm	87.5%			
					Shifting of rainfall	81.3%		
V2 (50–79%)	Temperature rise	56.3%	Excessive rainfall	72.5%	Fog	72.2%	Heat wave	56.3%
	Excessive rainfall	53.8%	Salinity intrusion in soil	66.3%	Temperature rise	70.9%	Lack of rainfall	52.5%
	Water pollution	50.0%	Freshwater scarcity	60.0%	Excessive rainfall	69.6%	Freshwater scarcity	38.8%
					Drought	68.4%		
					Ground water declining	68.4%		
				Tornado/Nor'wester	63.3%			
				Heat wave	59.5%			
V3 (30–49%)	River bank erosion	47.5%			Lack of rainfall	45.6%	Arsenic contamination	42.5%
	Drought	40.0%			Earthquake	43.0%	River bank erosion	33.8%
	Heat wave	37.5%			Hail Storm	40.5%		
V4 (<29%)	Riverine flood	22.5%	Sea-level rise	22.5%	Shifting of rainfall	24.1%		
	Water logging	18.8%	Fog	10.0%	Freshwater scarcity	13.9%		
	Hail storm	10.0%	Heat wave	7.5%				
	Shifting of rainfall	7.5%	Cold wave	5.0%				
	Fog	5.0%	Lack of rainfall	5.0%				

In addition to identifying the climate change and environmental concerns, the respondents were asked to explain the impacts on agriculture, water, fisheries, livestock, forestry, infrastructure, health and education sectors that were being affected by these specific variables in their perception. The respondents added that these sectors, when affected, also impact the households due to their effects on livelihoods. Lack of opportunities to generate income for households compels the majority of the respondents to migrate.



Narrow pathways, poor housing, inadequate water, sanitation facilities are very common in slums. Bholar Bosti (Slum) in Duaripara, Mirpur, Dhaka, Bangladesh.

The following four tables indicate the impacts of climatic variables on different sectors in the study locations and thus, the effect on livelihoods of the households surveyed in this research. Temperature rise, for example, is found to affect three sectors: agriculture, fisheries and health, primarily in Khulna, but its impacts are significant in the other three locations, as revealed in FGD and Table 13. Cyclones are found to also affect all sectors in Khulna and Patuakhali, followed by storm surge. Additionally, salinity intrusion significantly affects nearly all sectors, particularly in Khulna. Drought has been identified to be one of the main challenging factors that impacts every sector in Rajshahi. In Sunamganj, flash floods were identified as the most dominant variable affecting nearly all sectors. It can be noted that a number of hazards impact the health and education sector significantly as well; for instance, during and post cyclones, schools and educational resources, including books are damaged, families are displaced and in cases where schools are transformed into temporary shelters, education is also disrupted.

According to the FGDs, KIIs and community workshops, the impacts of climate change induced disasters and environmental problems affect most of the sectors including agriculture, water, fisheries, forestry, and health. This in turn affects farm-based livelihood options in almost all the study locations. Abul Kalam Azad, a farmer from Koira Upazila (sub-district) of Khulna District said “Cyclone Aila in 2009 affected agricultural land, water resources and infrastructure of almost the entire village. He also explained that the farmers failed to cultivate crops for more than two years because of salinity intrusion in the in their agricultural lands. Some people above 40–45 years of age continue with non-farm livelihood options in the study areas but many people between 18 to 40 years of age migrated to search for alternative livelihood opportunities, either in the nearest urban areas or in the capital city i.e. Dhaka or a port city i.e. Chittagong or Khulna.

Table 13: Impacts on sectors in study locations

Hazards	Impacts on sectors in Khulna study location								
	Agriculture	Water	Fisheries	Livestock	Poultry	Forestry	Infrastructure	Health	Education
Temperature rise	✓		✓					✓	
Excessive rainfall	✓	✓							✓
Lack of rainfall	✓								
Cyclone	✓	✓	✓	✓	✓	✓	✓	✓	✓
Storm surge	✓		✓	✓	✓	✓	✓	✓	✓
Salinity intrusion in water	✓	✓	✓			✓	✓	✓	
Salinity intrusion in soil	✓					✓	✓		
Drought	✓					✓			✓
Riverbank erosion	✓	✓	✓						
Declining groundwater									
Water pollution		✓	✓						
Riverbank erosion									✓
Heat wave					✓			✓	✓
Cold wave									
Fog									
Hail storm									
Water logging	✓	✓							
Flood	✓	✓		✓	✓	✓		✓	✓
Hazards	Impacts on sectors in Patuakhali study location								
	Agriculture	Water	Fisheries	Livestock	Poultry	Forestry	Infrastructure	Health	Education
Temperature rise	✓		✓	✓	✓	✓		✓	✓
Excessive rainfall	✓							✓	✓
Lack of rainfall	✓								
Cyclone	✓	✓	✓	✓	✓	✓	✓	✓	✓
Storm surge	✓	✓	✓	✓	✓	✓	✓	✓	✓
Salinity intrusion in water	✓	✓	✓	✓	✓	✓	✓	✓	
Salinity intrusion in soil	✓					✓			
Drought	✓								
Riverbank erosion	✓	✓							
Declining groundwater	✓								
Water pollution		✓						✓	
Riverbank erosion									
Heat wave	✓								
Cold wave	✓								
Fog	✓								
Flood				✓	✓			✓	✓
SLR		✓							
Arsenic contamination		✓						✓	

Hazards	Impacts on sectors in Rajshahi study location								
	Agriculture	Water	Fisheries	Livestock	Poultry	Forestry	Infrastructure	Health	Education
Temperature rise	✓	✓	✓	✓	✓	✓		✓	✓
Excessive rainfall	✓						✓	✓	✓
Lack of rainfall	✓					✓			
Drought	✓	✓	✓	✓	✓	✓		✓	
Riverbank erosion	✓						✓		
Declining groundwater	✓	✓						✓	
Water pollution		✓						✓	
Heat wave	✓			✓	✓	✓		✓	
Cold wave	✓			✓	✓	✓		✓	
Fog	✓			✓	✓	✓		✓	
Hail storm	✓					✓			
Flood	✓	✓		✓	✓		✓	✓	✓
Earthquake							✓	✓	

Hazards	Impacts on sectors in Sunamganj study location								
	Agriculture	Water	Fisheries	Livestock	Poultry	Forestry	Infrastructure	Health	Education
Temperature rise	✓				✓			✓	✓
Excessive rainfall	✓				✓			✓	✓
Lack of rainfall	✓								
Drought	✓	✓	✓	✓	✓	✓		✓	
Riverbank erosion	✓						✓		
Declining groundwater	✓	✓							
Heat wave	✓				✓			✓	✓
Cold wave	✓		✓	✓	✓	✓		✓	✓
Fog	✓			✓	✓	✓		✓	✓
Hail storm	✓					✓			
Water logging									
Flash flood	✓	✓	✓	✓	✓		✓	✓	✓
Arsenic contamination		✓						✓	
Earthquake							✓		

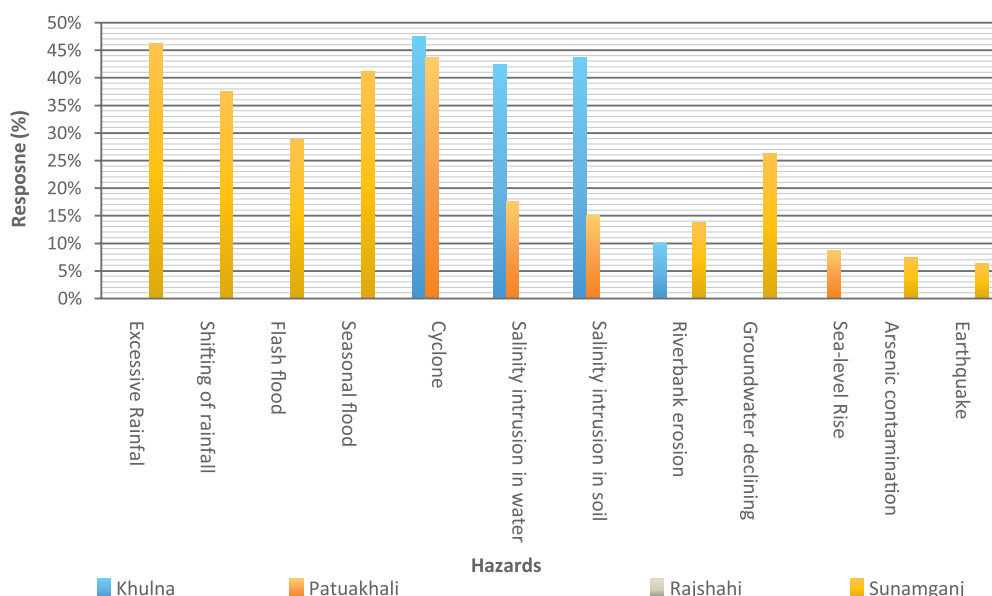
5.6.5 The migration, environmental degradation and climate change nexus

As seen above, Bangladesh is heavily impacted by manifestations of climate change and these are prevalent across the country at different geographical locations affecting lives and livelihood opportunities, particularly of the most vulnerable people. Though the four study locations are affected by a number of natural hazards exacerbated by climate change, in some of the areas the effects are more intense than the others. IOM identified

a set of sudden onset events (flood, cyclone and riverbank erosion) and slow onset events (coastal erosion, sea-level rise, salinity intrusion, temperature rise, changing rainfall patterns and drought) as key factors influencing migration (IOM, 2010).

In order to assess the impact of climate change and environmental degradation on migration, the respondents of the study locations were asked to identify some major natural hazards that influenced their decisions to migrate (Figure 21).

Figure 21: Major climate change and environmental hazards that contribute to migration decisions



The respondents from Khulna mentioned primarily four hazards that influence their migration decisions, as follows: cyclones (more than 47%); salinity intrusion in soil (around 44%), salinity intrusion in water (43%) and a few also mentioned river bank erosion (10%). In Patuakhali, cyclones were identified by nearly 44 per cent of the participants as primary reasons for migration, along with salinity intrusion in water by nearly 18 per cent and also in soil by 15 per cent of respondents. Additionally sea-level rise was also mentioned by 9 per cent of the respondents from Patuakhali. The responses gathered from Sunamganj identified the different climatic and natural hazards influencing migration decisions from the previous two districts. They identified excessive rainfall, which was mentioned by 46 per cent of the participants, as well as shifting rainfall patterns, mentioned by nearly 38 per cent of respondents. More than 41 per cent of the participants mentioned seasonal floods, and nearly 29 per cent mentioned flash floods as the two reasons for migration in Sunamganj.

In FGDs, KIIs and community workshops, the participants especially in Sunamganj clearly mentioned that heavy rainfall in a short period and shifting of rainfall affects their lives and livelihoods. One respondent from Sunamganj said, “Rainfall patterns have become very irregular, sometimes increasing and sometimes decreasing. That affects our livelihoods a lot.” These hazards often cause a lack of livelihood options, causing migration of groups of vulnerable people from this study area. It may be noted that about 55–60 per cent people in Bangladesh still depend on agriculture-related livelihoods. Excessive or erratic

behaviour of rainfall is affecting people's livelihoods and aggravating a food crisis in many places in the country (Hassan et al., 2015). Additionally, declining groundwater (more than 26%), riverbank erosion (nearly 14%), arsenic contamination (more than 7%), and earthquakes (more than 6% of respondents) were identified as some of the key factors motivating migration in Sunamganj. In participatory group discussions, people mentioned earthquakes as an environmental threat affecting migration decisions for people in Sunamganj. The respondents from Rajshahi, however, did not identify any specific climatic and natural hazards as influencers in decision making of migration. Rather, they identified non-climatic factors primarily as the reasons behind migration decision. On the other hand, the Upazila Project Implementation Officer (PIO) says, "a number of climate related events including drought, hailstorms, heat waves, cold waves and lightening are affecting the agricultural production a lot." These factors along with local political and social conflicts influence migration decisions of some people.

During interviews it was revealed that the poverty cycle, ecosystem and pattern of disasters needs to be understood as part of the nexus between climate change and migration. Where poverty is very high, out migration will happen and in these situations, climate change may be an exacerbating factor. Such migration can be both permanent and temporary. Occupational and livelihood factors act as pull factors. Poor access to health services, especially in Koira study area, scarcity of fresh water, degradation of top soil, salinity, water logging, soil fertility, all have an impact on livelihoods, social security, access to basic services and may lead people to migrate. The driving force for such migration in Bangladesh will most likely be cyclones, storm surges, riverbank erosion and salinity intrusion. According to a senior academic, it may not possible to accurately assess whether river bank erosion is natural or climate change induced. During an interview he argued, "that this challenge has implications for representing affected communities in policy debates, especially at a global level. He also explained that, "the impact of slow onset events are difficult to predict and it is difficult to prove that people are migrating solely due to climate change events. For example, people become economic migrants triggered by climatic stressors." He also argued that each ecological zone of Bangladesh needs to be studied separately to distinguish between the drivers of migration.

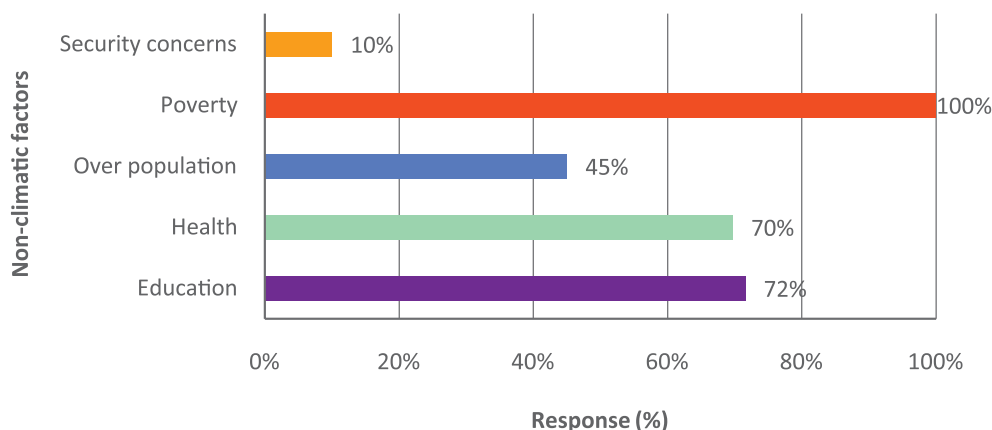
The government officials also explained the linkage between climate change and migration differently. According to officials from the Planning Commission and Ministry of Disaster Management and Relief, "climatic stressors first affect livelihoods in different sectors mainly in agriculture and water resources in the country." He also mentioned that many people in Bangladesh do not have the opportunity or capacity to diversify their livelihoods. He also said that "when people can no longer sustain traditional livelihoods, they tend to migrate in nearest urban areas." Frequent destruction of embankments also pushes migration of the vulnerable people, as mentioned by some interviewees. Climatic stressors also puts pressure on environmental degradation.

5.6.6 Non-climatic factors affecting migration in the study areas

In addition to climate change and environmental degradation drivers of migration, major non-climatic factors also influence the migration decision in the study areas (Figure 22). Of these, five major issues have been identified by the respondents. The entire study population identified poverty as one of the key factors for both internal and international migration. Migrant households mentioned this from their own experience while this was the perception of non-migrant households on the causes of the migration from their

respective villages. Nearly 72 per cent of the respondents identified education facilities and around 70 per cent expressed health issues as the other top factors affecting decisions to migrate. Around 45 per cent of the respondents also mentioned over-population as a concern, while only 10 identified security as an important factor prompting migration.

Figure 22: Major non-climatic factors that also influence in migration decisions



Although all of these issues are identified as non-climatic factors, poverty, health, education and even security are also affected by climate change. Socioeconomic safety, stability and livelihood opportunities are affected by climate change, as natural hazards cause huge damage to household assets, standing crops, fisheries and livestock. Losses incurred in these sectors may affect the households' overall wellbeing, as they affect health and education in turn, which keeps vulnerable people entrapped in poverty. Climatic variables such as cold-waves, heat-waves, salinity intrusion, floods, cyclones, drought and so forth also have long term consequences on health, as mentioned in FGDs and KIIs. Diseases and illness exacerbated by a changing climate also affect children and in the process, have an impact on their education in the long run. Interviews with policymakers also reaffirmed the findings that religious and idealistic beliefs, economic and livelihood factors, better education, communication, health and recreational facilities all influence migration decisions. However, some policymakers perceived these additional factors to be more influential than others.

5.6.7 Migration trends in the study areas

The majority of the participants, representing more than 80 per cent identified that migration is increasing a lot in recent times alongside the increasing impact and vulnerability caused by climate change. However, nearly 18 per cent of the respondents also felt that migration has not increased significantly over time, though it has somewhat increased in recent times.

5.6.8 Migration from the study districts by destination

When asked where the migrants go when they migrate in search of alternative livelihoods, the respondents said that in a majority of the cases, migrants move internally and mostly tend to return to their places of origin. Figure 23 below indicates the responses gathered on the types of internal migration in the study areas. It appears that nearly 66 per cent of the respondents identified that the migration process has been completely forced,

with highest in Khulna (95%) followed by Sunamganj (73%) and lowest in Rajshahi (36%), primarily due to various factors connecting to the variables of climate change and other non-climatic issues. More than 21 per cent also identified that while the migration was not completely forced, it was partially coerced and not fully voluntary. There was a wide consensus among policymakers that such migration is forced in nature and is increasing day by day. A senior government official says, “many people are displaced from coastal districts mainly due to cyclonic events in last few years.” In terms of international migration, most of the study people in Sunamganj and Rajshahi think that this was voluntary migration while most of the people in Khulna said it was also forced migration. According to FGDs and KIIs and CWs, migration is mostly a result of a group of climatic and non-climatic factors. Some climatic factors including cyclonic events, storm surges and flash floods directly push migration while poverty as a non-climatic factor influences migration. This opinion came from both migrant and non-migrant respondents.

Figure 23: Type of internal migration (n=160)

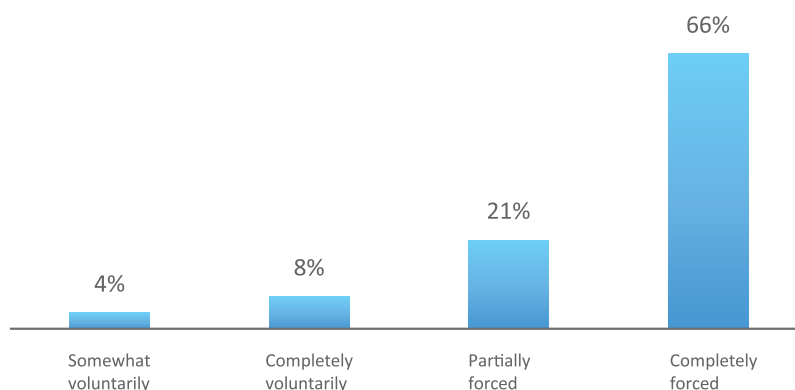
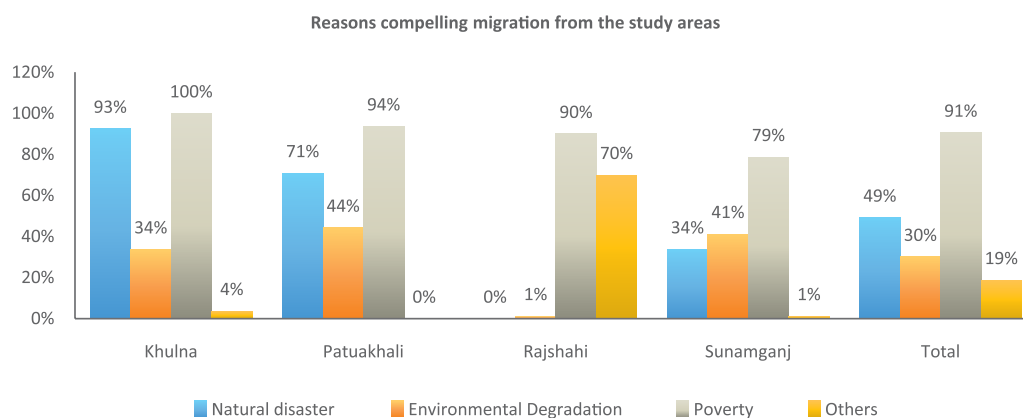


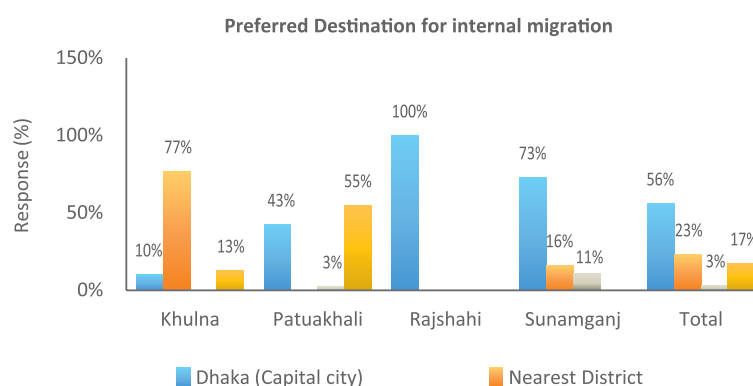
Figure 24 below showcases the reasons compelling migration from the study area. It was analysed earlier that the respondents in Rajshahi did not identify any particular climatic factors influencing their decision making for migration, and instead, they felt that non-climatic issues are the prime reasons behind migration. The following figure displays this finding as 90 per cent of the Rajshahi participants identified poverty and 70 per cent of them felt some other reasons behind forced migration but they did not mention any particular climatic factors influencing migration. Only one per cent of respondents from Rajshahi spoke about environmental degradation as a factor that compelled migration.

Amongst some of the factors identified in the survey, poverty was viewed by the respondents to be the most predominant issue for internal migration in all other three study locations (100% in Khulna, 94% in Patuakhali and 79% in Sunamganj mentioned this). However, 93 per cent of the respondents in Khulna also mentioned natural disasters as the reason behind internal migration along with 71 per cent in Patuakhali and 34 per cent in Sunamganj. Environmental degradation, which is also prevalent in some of the most impacted areas due to climate change, was also mentioned by 44 per cent of participants from Patuakhali, 41 per cent from Sunamganj and 34 per cent in Khulna.

Figure 24: Reasons compelling migration from the study areas

5.6.9 Preferred destination for internal migration

When the participants from study areas were asked about preferred destination for internal migration, the responses varied as every respondent from Rajshahi mentioned Dhaka, the capital city, while nearly 77 per cent of respondents from Khulna mentioned any nearest district (which is not the capital city). Slightly over 10 per cent of the respondents from Khulna spoke about migration to Dhaka while nearly 13 per cent mentioned moving to other internal locations. Dhaka was also a popular destination for migration among the respondents from Sunamganj as 73 per cent of the respondents from there mentioned the capital city, while around 16 per cent said the nearest district and nearly 11 per cent spoke about the nearest sub-district as a preferred migration destination. The respondents from Patuakhali mostly preferred other locations for internal migration (55%), and these were not the nearest district, sub-district or the capital city. Around 43 per cent of participants from Patuakhali, however, mentioned Dhaka as a preferred destination. The following chart in Figure 25 shows this finding on preferred destinations for internal migration.

Figure 25: Preferred destination for internal migration

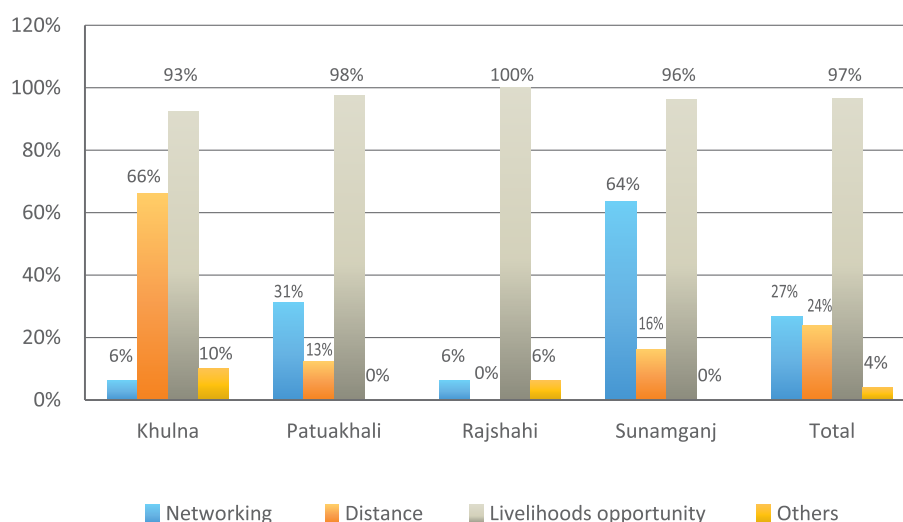
Policymakers also reiterated that even though destinations are primarily cities, social networks play important roles in choosing the destination. People usually tend to move to cities where they have contacts. People often also move to the closest cities, rather than

moving straight to the capital. Often rural to rural migration occurs, but there are many other Socioeconomic factors behind this. Ethnic and minority communities often tend to live with other community members.

5.6.10 What drives the decision on choice for internal migrants from the study areas?

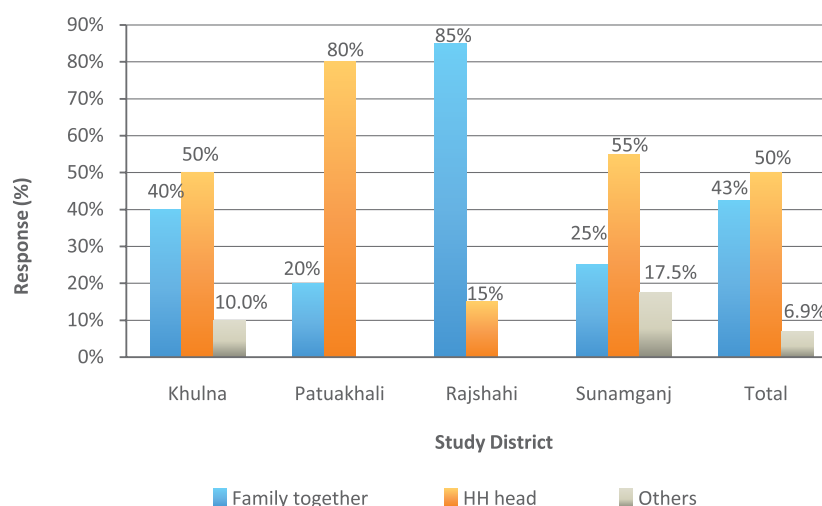
In connection with the earlier chart, Figure 26 below indicates the major factors that influence households to make internal migration destinations. A livelihood opportunity remains the main factor (97%) that drives the choice of destination. At least 64 per cent respondents from Sunamganj and 31 per cent from Patuakhali, however, also identified the existence of networks as the major factor for choosing their preferred destination. Similarly, 66 per cent of Khulna participants spoke about distance being an important reason for them to choose their preferred location for migration. This correlates with the earlier chart where nearly 77 per cent of the respondents from Khulna preferred to move to the nearest district for internal migration, rather than the capital city of Dhaka, which is further away.

Figure 26: Major factors that influence households to choose the destination



5.6.11 Who makes migration decisions in the study households?

When it comes to making the decision to migrate, respondents provided a varied picture by district, despite the total outcome showing a nearly equally divided response. Figure 27 below demonstrates these findings as Rajshahi and Patuakhali respondents provided a significantly reverse scenario as nearly 85 per cent of the respondents from Rajshahi said that they make decisions relating to migration together as a family. While at least 80 per cent of the respondents from Patuakhali mentioned that the head of the household, mostly male, makes the primary decision on migration. Around 55 per cent from Sunamganj and 50 per cent from Khulna expressed that the head of the household makes the decision, while 40 per cent from Khulna and 25 per cent of respondents from Sunamganj said that the family members together make the decision to migrate. The remaining 7 per cent represented others (e.g. friends, neighbours, relatives) who influenced them in their decision to migrate.

Figure 27: Who decides on migration in the study households (n=160)

5.6.12 Remittances from migrants in the study area

Of the total migrant households, over 41 per cent receive remittances. They spend these remittances on various purposes, but the main use is for the purchase of daily/monthly needs. The major areas for expenditure include health treatment, education, purchase of clothes, repayment of loans and crop cultivation. During the FGDs and KII, the study population explained that the migrant households initially spend the remittance incomes to meet the regular needs of the family. The second important issue is to save and improve household assets including construction, reconstruction, repairing of houses and the purchase of land, if possible.

Table 14: Households use of last remittance for various purposes by district

Last remittance used for	Khulna	Patuakhali	Rajshahi	Sunamganj	Total
Purchase of daily/monthly needs	97.5%	100.0%	82.6%	94.7%	93.9%
Health treatment	72.5%	30.8%	52.2%	39.5%	52.6%
Education	40.0%	46.2%	47.8%	42.1%	43.0%
Repayment of loans	42.5%	23.1%	43.5%	31.6%	36.8%
Cloths	35.0%	23.1%	26.1%	47.4%	36.0%
Crop cultivation	7.5%	0.0%	13.0%	18.4%	11.4%
Savings	0.0%	0.0%	30.4%	2.6%	7.0%
Others	7.5%	0.0%	4.3%	5.3%	5.3%

5.6.13 Views on other issues including institutions, policy and programmes related to migration

In the areas of origin, one particular example of an industry that causes environmental degradation was mentioned by a number of local and national level interviewees, is shrimp cultivation in the coastal areas. Salinity intrusion, a climatic phenomenon, is accelerated by human activities like shrimp cultivation. As shrimps need saline water to grow, shrimp

cultivators pump saline water inland to support production. Shrimp cultivation is a major source of export earnings for Bangladesh. But shrimp cultivation is less labour intensive than paddy cultivation, which in turn results in a lower supply of jobs, and thus has adverse effects on people's livelihoods. An interviewee in Rajshahi mentioned "many people from Chapainawabganj will migrate on a large scale in the future because paddy fields have been converted into mango orchards." Mango orchards are far less labour intensive than paddy field cultivation, which in turn, reduces the number of jobs available.

There was wide consensus among policymakers that at present, there is a need for a policy directive or institution for managing internal migration. This was mentioned repeatedly by government officials, academicians and CSOs. Academicians and government officials agreed that the primary responsibility of managing such migration should go to the local government division as the migrant's origin and destination areas both are local government units. However they also reflected the need of other public agencies involvement considering the dynamic and complex nature of the issue.

Government officials described how the government also has a number of relocation programmes in place, namely "Ashrayon", Guchogram, which relocates people to government-owned land. Guidelines and manuals have been prepared for different government-run relocation programmes, such as Ashrayon, but no specific policy is available. These documents are also not available publicly; hence they have not been comprehensively reviewed in this report. However there was a suggestion made by policymakers to evaluate and scale up such interventions. Each year, the Government also spends a considerable amount of resources to prevent river bank erosion.

The officials interviewed emphasized how the government is often faced with conflicting priorities, each of which demand attention and allocation of resources. Although the Government is aware of the issue and there is political commitment to the issue, priorities like poverty reduction, education, health, climate change and migration have received relatively less attention. According to Government officials, as climate change impacts are an emerging issue in Bangladesh, the Government wants to analyse the dynamics first before initiating interventions.

Pressure on urban infrastructure and challenges of urbanization were mentioned by the respondents, who highlighted the traffic congestion, and illegal utility connections used at slums. They also suggested urban planning must consider the attractiveness of cities as a migration destination.

Given the multicausal nature of migration, Government officials expressed enthusiasm for comprehensive methodologies, which could identify, track and quantify environmental migrants, even though this endeavor is a challenge globally and very difficult to achieve. Small-scale pilot initiatives, which eventually can be scaled up, were suggested by policymakers, which can provide estimates of environmental migrants. Examples of how this could be done include:

- At present the Census and Sample Vital Registration Survey are the only ways to track population within the country.
- Even though the population census does not report reasons behind internal migration, in the census questionnaire there was a question asking about the reasons behind internal migration. In that question, "natural disaster" is coded as a response. One Government official suggested this data can be used for the

purpose of quantifying the number of people migrating due to natural disasters. If a coded response relating to climate change effects is incorporated into the census questionnaire, then this could serve the purpose of quantifying environmental migrants. The data of Population and Housing Census is available online and open to the public for use.

- Using the voting lists of each constituent, which are updated every 5 years, could also be used to track internal migrants.
- Comparing population and housing census data of two or more consecutive decades and population growth may hint at which districts and upazilas are experiencing out migration.
- Every union in Bangladesh has a Union Information and Service Centre which can be used for tracking population in the unions.

5.6.14 Gender and other vulnerable populations

Gender differentiated impact of the migration-climate change nexus

Previous studies have indicated that climate change has a gender differentiated impact. In this context, the study also aimed to understand whether the nexus between climate change, environmental degradation and migration, identified by respondents also has specific implications for different genders.

When asked about whether men and women are differently affected by climate change and disasters in the study areas the response was nearly unanimous. Ninety-two per cent of respondents felt that the impacts vary between two genders, and that women are more vulnerable to the impacts.



Females, children and elderly are usually left behind in the environmentally affected area while the men migrate to urban centres. Dokhin Bedkhashi, Koyra, Khulna, Bangladesh.

The table below show that members of the households feel that there are implications when either a male or female member migrates and leaves behind the other. More than

87 per cent of the respondents said that when male members of the households migrate, there are indeed impacts on female members who are left behind in their homes (e.g. an increase in household and farming responsibilities, financial insecurity, social insecurity, psychological pressure and so on). Normally men migrate to a nearby district or town, and in some cases to the farthest city as mentioned by the participants in FGDs and community workshops. Amir Hossain Howladar, a farmer from Kalapara Upazila of Patuakhali district said that “many poor farmers seasonally migrate to either Patuakhali town or Barisal for other jobs.” He also added that “most of them drive either a rickshaw or van in the destination, but some others work in brick fields.” Usually internal migration lasts between a week to around a year. While migrating, women and children left behind have to stay in the villages and are left to face many challenges. During FGDs in Koirā Upazila of Khulna District, a woman said “I take a loan from neighbours or relatives to manage household needs because my husband sometimes does not send money from the work (destination).” This is difficult, as people often do not want to lend money if they see that the husbands have migrated. Even if they do, they usually pressure the woman to return the loan as soon as possible along with high levels of interest. Sometimes women have to face other social implications when their husbands migrate. During one of the FGDs, one respondent from Sunamganj noted that women sometimes are viewed differently if their male member of the household is not present. They are taken advantage of and seen as vulnerable. Respondents also said that women left behind live in fear of robbers at night, and fear their property will be stolen.

However some cases also highlighted the benefits of migration: women mentioned that they receive remittances from male family members who have migrated and happily meet their needs. They now send their kids to schools and do some small household based activities e.g. cultivation of fisheries in the pond, what vegetables to be farmed, with more freedom. This demonstrates that when migration is properly managed it can be a win-win situation for all, migrants and their families.

Quite similarly to the perceptions of migration on women, more than 83 per cent felt that when female members migrate and leave behind males in their households, it has a strong impact on those left behind. This demonstrates the co-dependence of both genders and that separation impacts their lives in various ways.

Table 15: Implications of migration of specific household members on the members left behind

Response	Does migration of male members have any implications on female members left behind	Does migration of female members have any implications on male members left behind
Yes	87.2%	83.1%
No	12.8%	10%

However, the implications are significantly higher when any member migrates and leaves behind the most vulnerable ones in their families, usually the children, physically challenged or the elderly. Nearly all (99%) respondents in study areas felt that there are implications on children, while 97 per cent felt it also affected physically challenged members of their households who are left behind, and 94 per cent thought that it impacts the elderly members of their households. These vulnerable members of the families are

highly dependent on the wage earners of their households for care-giving, assistance with daily necessities, as well as for food, water, medication and accommodation. The absence of healthy members or the primary caregiver leaves vulnerable groups both physically and psychologically distressed, which impacts their overall wellbeing and lives significantly. In addition, some internal migrants, mainly male, are unable to send money to their families on time. This affects the women and children left behind, as mentioned by many women participants in the FGDs and community workshops.

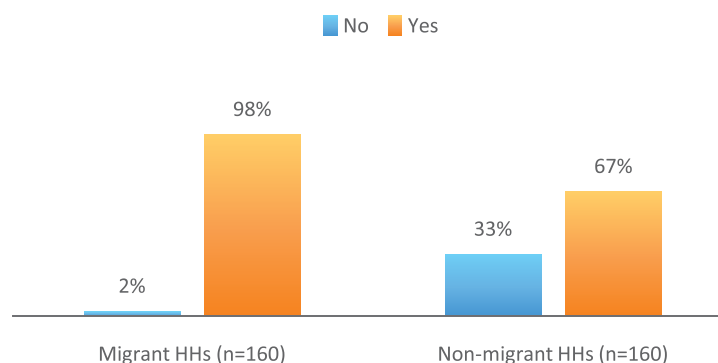
Table 16: Anticipated impacts of migration on vulnerable family members

Household Member	Yes	No
Children	99%	1%
Physically Challenged HH member	97%	3%
Elderly member	94%	6%

5.6.15 Adaptation actions of study households

Examining adaptation actions is also relevant to our understanding of whether migration is already being employed as a climate change adaptation strategy. The majority of the households from the study areas responded that they have taken and are continuing to take initiatives to deal with the adverse impacts of climate change to protect their lives and manage their livelihoods. The study shows that at least 83 per cent of the households from Khulna, Patuakhali, Rajshahi and Sunamganj have taken some initiatives. These initiatives are diverse, implemented by households at different levels and scales to address the effects of climate change. Only 17 per cent of them expressed that they have not taken any particular steps to overcome the challenges of climate change. The following Figure 28 shows that there is a difference between migrant and non-migrant households in terms of taking action to deal with the adverse effects of climate change. Significantly, nearly all migrant households, (around 98%), identified that they have taken at least one initiative to address the adverse impacts of climate change compared to the 67 per cent of non-migrants respondents in the study areas. During FGDs and KIIs, it was clearly found that the migrant households often experience livelihood and food crises in different months of the year especially during late monsoon/early post-monsoon (August–October). Migrant households use different measures to adjust to this adverse condition. They change their livelihoods, take loans, and migrate to search for jobs, as mentioned below. This contributes to making the households more resilient in the face of the adverse impacts of climate change.

Figure 28: Difference among migrant and non-migrant households in dealing with adverse climate change effects



5.6.16 Type of adaptation action taken by the study households

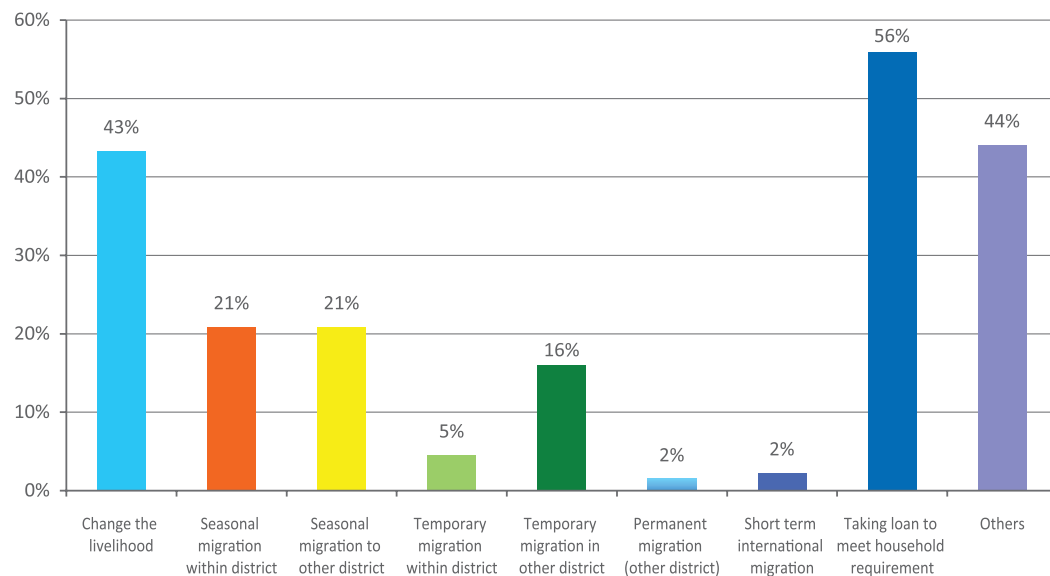
Figure 29 provides a picture of the various initiatives that the respondents have taken in the study areas. The top two actions involved taking loans to meet their household requirements, which is mentioned by more than half (56%) of the total respondents, and undertaking a move to seek alternative livelihood options, which was mentioned by more than 43 per cent of the respondents. The male farmers usually engage in rickshaw/van pulling, fishing, construction work, wood cutting and so on. Poor female household members also engage in fishing, construction work or offer domestic help to neighbouring rich households. Various other small initiatives make up more than 44 per cent of the actions initiated by the respondents. These include household members moving for seasonal migration within the country, which were identified by around 21 per cent of the participants. At least 16 per cent of the respondents also said that they choose temporary migration in other districts to overcome the adverse impacts of climate change and to generate a living for themselves and their family members. A small number of the respondents also identified some other options such as temporary migration within their districts, permanent migration within and to other districts, short-term and also long-term international migration. While all of these initiatives reflect that the core of their actions is associated with economic issues as they explore options to generate livelihoods and associated resources, the study also shows that vulnerable populations use migration as a way to deal with livelihood insecurity and declining incomes. However, at the same time, migration requires resources, which are in short supply due to poverty in the study areas. Most of the respondents indicated that they use more than one adaptation option, depending on the local adverse condition and seasonal vulnerability.

As mentioned in the FGDs and community workshops, the study communities experience changes in weather patterns including variations in temperature, rainfall, heat waves and cold waves in almost all the study areas, with an increase in recent years. The post-monsoon season is really crucial for most of the people, especially in Khulna and Rajshahi, while the monsoon season is challenging for the study communities in Sunamganj. Generally, many people manage to migrate internally or internationally, but problems remain with the extremely poor and disadvantaged groups, such as the elderly and single parent households.

The FGDs further established that everyone who was affected by climate change took some form of initiative to deal with the impacts. In Sunamganj, one participant iterated that simply taking a boat to school during the flood season was a form of adaptation by the children. Furthermore, simple tactics of storing dried food for times of crisis (during and post disaster period) were also common in this area.

In Patuakhali, during the FGDs, participants also identified disaster preparedness techniques, noting that they commonly stored food for times of crisis, and conserved water. Respondents from drought prone areas in Rajshahi made similar statements.

Figure 29: How the study households deal with adverse effects of climate change



During discussions with key informants and participants in FGDs and community workshops, most of the people mentioned that they primarily try to adapt to the adverse conditions by changing livelihoods, taking loans from friends, relatives and neighbours. Respondents specified that they do not plan to migrate initially, but unfavourable climatic conditions, socioeconomic and demographic pressures and lack of local level programmes on livelihood security together influence them to make drastic decisions regarding migration. Climate change-induced hazards and environmental concerns that affect existing livelihoods remain a major push factor for migration. Overall, variation in temperature and rainfall, drought, flood, including flash flood, cyclones, salinity intrusion and poverty are important factors that influence migration from the study locations, as indicated in the FGDs and KIIs.

5.7 Conclusion and recommendations

Although Bangladesh has many similar characteristics to other countries in South Asia, the extent of the challenges it faces are unique. The impacts of climate change on this small sub-tropical country are intense and damaging, and are on the increase. Within the country, there are zones (e.g. coastal zone, charlands, haor and hilly areas) that are worst affected, and the rural, poverty-stricken populations of these areas are the ones who suffer the most.

As perceived by the study communities, the major climate-induced hazards include cyclones, storm surges, coastal floods, flash floods, droughts, variations in temperature and rainfall and environmental degradation such as riverbank erosion, declining ground water level, freshwater scarcity, arsenic contamination, earthquake and water pollution. These hazards directly and indirectly affect natural resources and key sectors including agriculture, water, health, infrastructure, fisheries, livestock, forestry, biodiversity, ecosystems. Furthermore, climate change and environmental degradation sometimes ruin crops, affecting businesses and destroying other infrastructure as well as homes. This, according to the respondents, makes livelihood options scarce, making communication tough especially in the coastal regions, such as Khulna, and also impacts on people's domestic lives. According to the respondents from the survey, these factors have intensified over the last 10 years in terms of the impact they have on the lives and livelihoods of the people in the area. This particularly exacerbates the vulnerability of rural communities including poor, disadvantaged and marginalized people. As a result of the impact of climate change on socioeconomic conditions, migration has been increasing with large numbers of people travelling to other regions in search of a better life and livelihood.

Other non-climatic factors, such as higher education study opportunities and the lure of alleviating poverty, combine with climatic factors to push more and more people to migrate away from these climate change-affected areas.

Of the migrants, most are male members of the poor and lower middle class families. This appears as the dominant practice for two reasons, firstly, as most households have male heads that are often responsible for earning an income and searching for alternative livelihoods. Secondly, usually male members tend to fall within the age brackets of the working population. Older male members do not usually migrate unless pushed to extreme circumstances, such as the unavailability of other family members for migration.

Similarly, the women in the households that experience male outmigration stay at home to take care of household responsibilities, as well as the children and the elderly. After migrating, the male members send back income generated from livelihood activities. However, there were reports of incidences where money was not sent, leaving the women at home striving to earn for themselves and their families. Most respondents agreed that women face challenges following the migration of men.

Given that the majority of the population in the areas where the surveys were conducted are engaged in the primary sector, it was noted that formal education is not an important factor in securing employment. However, when livelihoods become scarce due to environmental factors, migrants with low skill levels move to urban areas and are absorbed in the informal sectors. At the same time, for those who have minor academic degrees, migration to towns and cities is a more attractive option, as job opportunities (often with higher salaries) for those with educational degrees are available even in the secondary and tertiary sectors. The results also clearly demonstrate that the average household income and average land size of migrants households are lower than the non-migrant households. But in terms of adaptation practices by number of households, migrant households are well advanced in comparison to non-migrant households. Remittances received by the households, although at present used largely for daily needs and unproductive purposes, contributes to the household income, filling the livelihood gap that arises due to environmental factors.

The study thus provides a concrete evidence base to amend the legal and policy framework so that it addresses the climate change, environmental degradation and migration nexus. A comprehensive strategy that can effectively address these cross cutting issues, and leverage migration and remittances will also work for the benefit of the vulnerable populations, host societies, and the Government.

Recommendations

It has been observed from the field data, that in most cases, if not all, migration can help families stay afloat, if not improve their financial conditions. Thus, in a disaster stricken country like Bangladesh, migration can be a blessing. Yet, to ensure that migration can be an effective strategy to adapt to climate change and mitigate the impacts of disasters, the government needs to firstly, incorporate migration into policies related to climate change, disaster risk reduction and secondly, ensure that they are effectively implemented. This will enable a multi-sectoral and whole-of-government approach in addressing these challenges and will ensure that the benefits of migration are maximized. Several suggestions are given below in these regards:

Capacity building for vulnerable populations and migrants

- Creation of alternative livelihood options or employment opportunities, along with skills development in poverty stricken, climate change affected areas;
- Training and curriculum development to assist affected communities to adapt to a changing climate by incorporating new techniques and technologies in resource-based occupations;
- Skills development for potential migrants so that they can acquire decent jobs in the destination regions;
- In order to ensure that remittances received are used effectively by the communities or appropriately saved, training on financial literacy and planning to encourage savings as an insurance for times of crisis, should be undertaken;
- Information campaigns and awareness-raising are needed in vulnerable local areas on the prospects, challenges and limitations of migration. This would help the households to make effective decisions on migration at the beginning, including who to migrate, where to migrate, and how migration may help the family and so on.

Enhanced data collection and research

- Enhancing data collection by developing and updating a migration database for both international and internal migrants at the union level;
- Comprehensive research with wider geographical areas (with a large sample size) on the further relationship and significance between migration, environment and climate change, and on spending patterns of remittances received to determine the conditions necessary for migration as an adaptation strategy;
- Further comprehensive research and discussion on seasonal migration programs to enable affected communities to have a guaranteed income.

Policy development and amending the legal framework

- Proper implementation of current environment related laws (Water Act, 2013; Environment Conservation Act, Disaster Management Act and so on) to protect natural resources and vulnerable ecosystems;
- Considering the lack of policy and institutional arrangements to manage internal migration, it is of utmost important to develop “National Action Plan” or similar, for effective management of migration in Bangladesh, considering current and potential climate change and environmental threats;
- An Internal Migration and Relocation Policy needs to be developed as part of an effective adaptation and development strategy;
- Institutional arrangements to manage internal, seasonal, temporary and forced migration is urgent.

Provision of/access to services and development of programmes

- Programmes and projects need to be initiated to protect natural resources, low lying areas, agricultural fields and water resources;
- Provide context specific low cost technological options, especially in agriculture and water supply;
- Registration and transportation to destinations can be arranged, so that people wishing to migrate can sign up at the Union Parishad and be supported appropriately;
- Migrant resource centres in areas with high outmigration could be set up to provide necessary and up to date information on the jobs available, destinations and other services such as assistance with documentation, training, etc;
- Collaborative programs can be set up to identify employment options in the destination areas, ensuring that migrating members will find livelihood options for the period migrated. Setting up of rosters listing short-term job opportunities with skill requirements, and details at every Union Parishad in the vulnerable eco-zones. This could ensure jobs and skills matching, and allowing for full and satisfactory employment on both sides, i.e. for employer and job-seeker;
- Signing up and registering for migration can thus ensure that monitoring is carried out for each migrating household member, and the amount of remittances being sent back to family members could also be recorded. This could be piloted in some migration hotspots and later could be scaled up based on the pilot experience;
- NGOs need to set up microcredit programmes for extreme poor families and households, thus encouraging in situ adaptation.

6

THE MALDIVES CHAPTER – FINDINGS OF THE STUDY

The Maldives is a beautiful island nation, which attracts hundreds of thousands of tourists to its sandy beaches and crystal clear lagoons annually. Of its 1,192 islands, only 188 are inhabited by its 341,256 nationals and an additional 116,000 migrant workers (Merret, 2015). Male' is home to approximately 151,459 people which comprises locals and expatriates (Government of Maldives, National Bureau of Statistics, 2014). Historically, locals identified the islands as being habitable by considering such environmental factors as accessibility to fishing grounds and presence of fresh water in the ground water lenses. A decisive factor was also the protection afforded by the islands, which could avert pirate attacks (Jameel, 2007).

The Maldives encompasses an area of roughly 107,500 square kilometres, making it the smallest country in South Asia (Zahid, 2011). The width of its island chain varies from 80 to 120 kilometres from west to east and it has an average estimated elevation of 1.5 metres above sea-level (Shaig, 2008). However, this decreases to less than 1 metre for 80 per cent of its islands and as such it is considered to be one of the countries most vulnerable to the predicted consequences of climate change. Maldives' minimal contribution to global greenhouse gas (GHG) emissions, estimated to be around 0.001 per cent, does not decrease the threat posed by climate change. Tourism and fishing are the largest contributors to the country's GDP, contributing 34 per cent (UNDP, 2015) and 6.6 per cent (2009 estimates) respectively, and rely wholly on the health and aesthetic of Maldives' coastal and marine features (UNEP, 2002).

However the risks of climate change are not solely monetary. During the 1998 El Niño event the Maldives was subject to coral bleaching which decreased its live coral cover to a mean of 2.1 per cent from pre-bleaching levels of 30–45 per cent (MRC, 1999). Coral reefs serve as natural breakwaters and with their damage comes the greater risk of losing the natural protection of the islands from the waves and currents, in turn increasing the likelihood of beach erosion and inundation (UNEP, 2002). The rise of sea-levels also increases the salinity of ground water supplies leading to freshwater shortages and disease outbreaks (UNEP, 2002).

The Intergovernmental Panel on Climate Change (IPCC) states in its fifth assessment report that without any mitigation to curb the onset of climate change, there will be a global increase of surface temperatures, from 3.7 degrees Celsius to 4.8 degrees Celsius in 2100. (IPCC, 2014). If these predictions are realized then there will be very little chance of survival for the coral reefs of the Maldives. The IPCC also projected a sea-level rise of 0.09m to 0.88m for 1990 to 2100; with 80 per cent of the Maldives being less than a metre above sea-level, the slightest rise in sea-levels will prove dire, "threaten[ing] the very existence of life and livelihood in the Maldives" (UNEP, 2002).

The single largest natural disaster to impact Maldives in recent history was the Indian Ocean tsunami of 2004. Due to this disaster, Maldives faced large-scale internal displacement of

people. The tsunami of December 26th, 2004 caused the residents of this island nation to realize the fragility and the vulnerability of the country in the face of climate change and natural hazards. More than 100,000 citizens were impacted either directly or indirectly by this catastrophic event (representing around one third of the total population); 82 people died, 26 went missing and 1,313 were injured. More than 15,000 people were displaced (Government of Maldives, Ministry of Planning and National Development n.d.). A 4.5 per cent negative growth rate of the economy was noted due to the decrease in tourism in 2005 (Red Cross, n.d) and total damages were estimated at 63 per cent of the GDP.

It is therefore evident that climate change can have disastrous short term as well as long-term effects on the islands, including erosion, destruction of infrastructure and coral reef damage. It can affect the nation's health, food security, water resources and the livelihoods of its inhabitants. Thus, the expected increase in sea-level rise, the intensity of extreme weather events and the seriousness of their adverse consequences have necessitated that the Maldives consider climate change and disaster management in all aspects of its future development plans. Consequently it is essential that the strategies and adaptation measures established at the national level be reflected in the existing island development plans. With the involvement of the community, coping strategies for the impacts of climate change need to be established through island development plans and through various development projects.

As a result of its precarious position, Maldives is a vocal nation and plays a lead role in the international community advocating the protection of vulnerable States and the importance of taking steps to reduce GHG emissions (UNDP, 2002). Even though Maldives is active in advocating for climate change issues at the international level, at the national and local levels Maldivians are not aware of the impacts of climate change and its consequences on the Maldives islands and of its importance and relevance in planning for adaptation and designing short, medium and long term plans.

The Maldives comprises of 1,192 islands grouped into 26 natural atoll formations, out of which 188 are inhabited islands. The most densely populated island is the capital city Male' with a land area of 193.2 hectares. The 2014 census results show that 125,969 people reside in Male' with a population density of 652 persons per hectare. Half of the Maldives population lives within 100 metres of the coast and 1-metre rise in sea-level will inundate 80 per cent of the country's land area. The impacts of climate change on this small island nation are on the rise. The major climate-induced hazards include storm surges, tidal waves, sea swells, variations in sea surface temperature and rainfall and environmental degradation that directly affect the livelihoods of the country, which are dependent of fishing and tourism sectors. Indirectly climate change impacts will also affect the agriculture sector, the fresh water resources, and the health sector. The findings discussed in this chapter explore the views of the respondents on hazard problems linked to migration. Temperature rise, excessive rainfall, shifting rainfall and drought are the only categories where only 0–12 out of the 320 households have linked climate change hazards and migration.

6.1 LITERATURE REVIEW ON THE CLIMATE CHANGE AND ENVIRONMENTAL FACTORS THAT AFFECT MALDIVES

Maldives' islands are exposed to different vulnerabilities with regard to climate change, with, for example, the eastern side of the Northern and Central islands of the archipelago being

highly vulnerable to tsunamis. The Northern islands also have the greatest exposure to sudden onset disasters such as surge hazards and cyclones; other hazards such as earthquakes, thunderstorms, flash floods and heavy rain, and prolonged dry periods have also been recorded to affect the islands in the recent years (UNDP, 2006). However the most critical hazards to the Maldives are slow onset disasters, such as coastal erosion, sea-level rise, salinity intrusion, rising temperatures, changing rainfall and drought patterns, sea surface temperature rise, and changes in monsoon patterns. The low elevation of the islands makes them more vulnerable and causes beach erosion and, along with the intrusion of salt-water into the fresh water lenses caused by sea-level rise, some islands like the island of Holhudhoo have become uninhabitable. Additionally, sudden onset disasters, such as the 2004 tsunami and tidal waves have prompted the relocation of communities to safer habitable islands. An example of this is the community of Kadholhudhoo that was relocated to Dhuvaafaru during the 2004 Tsunami. Some of the details of the hazards are explained below.

6.1.1 Atmospheric and hydro-meteorological hazards

Storms

During the monsoon season, heavy rains and strong winds affect the Maldives. Tropical cyclones and severe local storms (thunder storms/thunder squalls) have affected Maldives in the past. Some tropical cyclones hitting Maldives are destructive since these come along with strong winds, which may exceed 150 kilometres per hour. In addition to storms and cyclones, rainfall of above 30 to 40 centimetres in 24 hours and storm tides that often exceed 4 to 5 metres are devastating to travellers and fisherman, and to farmers, who are impacted due to flooding from heavy rains. Data indicate that the probable maximum storm tide in northeastern islands of Maldives can be about 2.3 metres, which can inundate most of the northern islands (UNDP, 2006).

Cyclones

Since the Maldives archipelago is near the equator it provides protection from cyclones. These cannot be formed near the equatorial regions because of lack of favorable conditions for a cyclone to be formed. However the archipelago is sometimes struck by cyclones passing through the Bay of Bengal while storms and very strong gusts of wind sometimes occur during the rainy season, mostly in June/July and August and sometimes until October/November, depending on the current monsoon and its intensity. Majority of the cyclonic disturbances cross only the northern region; the frequency and wind speed decreases as the cyclone travels from north to south. Between 1877–2004 only 11 cyclones crossed Maldives, most of which crossed the northern part; cyclone frequency decreases from north to south. The maximum cyclonic wind speeds predicted for the northern part of the Maldives range from 84 to 97 knots, with a return period of over 130 years (UNDP, 2006).

Long distance swell waves

The three most notable swell wave events occurred in 1987, 2005 and 2007. These events caused extensive flooding, economic loss and disruption to daily life; Male' and the International Airport were among the worst hit with extensive flooding and erosion. In April 1987, a storm centre in the southern Indian Ocean resulted in long-distance wave transmission that passed through much of the Maldives archipelago. This event caused estimated damages of USD 4.5 million to Male' International Airport alone (Government

of Maldives, Ministry of Home Affairs Housing, and Environment, 2001). The same year, the country again faced storm surges in June and September. Although these surges were less extensive than the one in April of the same year, many of the agricultural fields were inundated by seawater and some causeways linking islands were badly damaged. (DOM data in Shaig 2006; Government of Maldives, Ministry of Home Affairs Housing, and Environment, 2001; MEEW, 2007; UNDP 2006, 2007; Ramiz, 2010).

Monsoonal flooding or udha

Maldives is also affected by an annual flooding event known as udha, a unique phenomenon to the Maldives. Although the causes of udha are unknown, it can be described as “the annual rise in the water surface on the coast during the Southwest monsoon which causes limited coastal flooding with a water depth of less than 0.6m.” (Shaig, 2006; UNDP, 2007). Udha has been experienced in many islands of the Maldives and is a common phenomenon, particularly during the southwest monsoon, and is often associated with changes in “Nakaiy” (the fortnightly intervals of the Maldives’ unique weather calendar). The report on the Detailed Island Risk Assessment in Maldives described udha as a “gravity wave phenomenon”, suggesting that that these waves originate as swell waves from the Southern Indian Ocean, which combined with the onset of southwest monsoon forms (UNDP, 2007; Minivan News, 2014).

Heavy rainfall and flooding

The low-lying coral islands of the Maldives are especially vulnerable to flooding due to heavy rainfall. Average rainfall per month is 200 mm, however during the northeastern monsoon (November and December) near normal to above normal rainfall is predicted. Given the small size of most islands and the scarcity of land, setbacks are either not feasible or offer limited protection. Between 2000 and 2006, 45 per cent of all inhabited islands were flooded at least once, with 19 per cent of islands inundated regularly, or at least once a year. Over the last six years more than 90 islands (45% of all islands) have been flooded at least once and 37 islands have been inundated regularly or at least once a year (Shaig, 2006). During the severe weather event of May 2004 alone, at least 71 islands (36% of all inhabited islands) were flooded due to heavy rains (Ramiz, 2010). Flooding due to rain has become a hazard for the local farmers when their plots are inundated with water. They suffer from economic losses due to the farm plots being flooded and the health consequences are evident from the dengue outbreaks in these communities. The Ministry of Agriculture receives a number of request letters from farmers for assistance and formal letters from island councils outlining the flooding and loss of yields from the taro fields during the wet season in the southern most atoll communities, which are further evidence of the communities facing this hazard.

Table 17: Number of requests sent to Ministry of fisheries and agriculture since 2012

Year	Island	Reason
2012	L.Dhanbidhoo	Heavy Rain - October
2012	L.Hithadhoo	Heavy Rain - October
2012	L.Kunahandhoo	Heavy Rain - October
2012	L.Gan	Heavy Rain - October

2012	Gdh.Gahdhoo	Heavy Rain - October
2012	Gdh.Vaadhoo	Heavy Rain - October
2012	Gdh.Fiyoary	Heavy Rain - October
2012	Hdh.Nolhivaranfaru	Heavy Rain - October
2012	Ha.Kelaa	Heavy Rain - October
2012	Ha.Baarah	Heavy Rain - October
2015	Ga.Nilandhoo	sea swells/taro field - October
2015	Gdh.Gan (uninhabited island)	Heavy Rain - October

On 24 October 2015, the southern atolls in the Maldives were hit hardest by heavy rains and flooding, according to the Disaster Management Centre. A centre official told Haveeru that the worst hit islands included Hithadhoo, Fuvahmulah in Seenu Atoll, Gadhdhoo and Vaadhoo in Gaaf Dhaal Atoll, and Villingili and Gemanafushi in Gaaf Alif Atoll.

Table 18: Affected areas due to heavy rain and flooding from 1991

Year/ month	Affected area
1991 (30 May–12 June)	Southern most atolls and other islands
1996	Central atolls including Male'
2002	Central atolls
1993 September	Male'
2005 July	Southern atolls
2005 October	Southern atolls and Male'
2006 September	Central atolls including Male'

6.1.2 Geological hazards

Earthquakes

UNDP (2006) has developed a seismic-zoning map for Maldives, which states that the likelihood of earthquakes in Maldives is limited to only the southern parts of the country, namely Seenu, Gnaviyani, Gaafu Alifu and the Gaafu Dhaalu atolls. Since earthquakes are known to cause damage to life and property, the population of these atolls faces a risk, however the return period expected for any such event is 475 years. The maximum predicted intensity, based on Modified Mercalli Intensity (MMI), falls within categories 2 and 3 out of the 12 categories of MMI (UNDP, 2006).

Table 19: Natural Disasters in Maldives from 1900 to 2011

Hazard type		# of Events	Killed	Total Affected	Damage (000 US\$)
Earthquake (seismic activity)	Tsunami	1	102	27,214	470,100
Epidemic	Bacterial Infectious Diseases	1	219	11,258	-
Flood	Unspecified	1	-	300	6,000
Storm surge/ coastal flood	-	1	-	1,649	-
Storm	Local Storm	1	-	23,849	30,000

6.1.3 Climate change related hazards

The consequences of climate change, which will impact, and are already impacting, the Maldives adversely are: beach erosion, sea-level rise, coral bleaching and changes in the weather conditions and slow onset disasters, such as ground water salinization and the indirect effect of these on lives and livelihoods. Prior to the 2004 tsunami, Maldives had not experienced any major natural disasters. However, a few small-scale natural disasters, ranging from tidal surges to mild earthquakes, had been recorded (UNDP, 2006). Of the 198 inhabited islands, 88 face perennial beach erosion (Government of Maldives, Ministry of Home Affairs Housing, and Environment, 2004). In 2004, 97 per cent of inhabited islands in Maldives experienced coastal erosion and 64 per cent of them had severe erosion. The problem is not specific to inhabited islands, as a large number of tourist resorts have also reported ongoing erosion (Government of Maldives, Ministry of Home Affairs Housing, and Environment, 2004).

Sea-level changes are determined by many factors and often occur slowly, over a varying period of time from decades to centuries. With climate change, the pace of sea-level rise is accelerating. A sea-level rise of a half a metre would place small island States including Maldives, Tuvalu, the Marshall Islands, Kiribati amongst others in danger of inundation. Similar to other small island States with a low average height above sea-level, (Maldives having an average height of 1.5 metres above sea-level) any increase in sea-level is likely to significantly affect the Maldives.

Projected sea-level rise = 0.09m–0.88m (1990 to 2100). Three quarters of land area of the country is <1m above mean sea-level. Consequences: life and livelihood threat, inundation, storm surge, coastal hazards, shoreline erosion, lack of safe drinking water, disease outbreak, etc. (UK Aid, 2010).

This was already mentioned in the IPCC's first assessment report which stated that global warming will accelerate sea-level rise and change marine ecosystems, with considerable socioeconomic consequences. Even a rise of 30–50 centimetres (projected by 2050) would threaten low islands and coastal zones, such as the Maldives. "A 1-metre rise by 2100 would render some island countries uninhabitable, displace tens of millions of people, seriously threaten low-lying urban areas, flood productive land, contaminate freshwater supplies and change coastlines" (IPCC 1990:3; IPCC 1992:55, 89).

Impacts of sea-level rise

Sea-level rise, salt intrusion into the ground water aquifer, salinization of soil and flooding caused by increased rainfall are some factors impacting the farmers of the Maldives. In the future, this will drastically impact the country's agriculture and food production. In the Maldives, agricultural products are limited to watermelon, pumpkin, cucumber, cabbage, cassava, sweet potato, yam, chilies and taro. These crops are cultivated in cleared plots of natural vegetation (a mixture of flood and salt-resistant bushes and shrubs, intermixed with coconut trees, which are quite resistant to salinization). Fruit trees are grown in home gardens and include mango, papaya, breadfruit, stone apple, drumstick and various citrus varieties. Papaya and bananas are also grown in home gardens and in agricultural plots. Furthermore, due to a heavy reliance on imports for all food requirements, the Maldives is also vulnerable to the impacts of climate change on agriculture in other nations. The NAPA has identified increased local food production as a key adaptation measure to tackle such food security issues posed by climate change (UNFCCC, 2010).

Sea-level rise could render the prospects of sustainable subsistence agriculture in some areas (including globally) non-viable, in turn, prompting migration in situations where farming practices can no longer be adapted to changing environmental conditions.

If inundation does occur, planned relocation would also be a necessary strategy and needs to be considered, such as in the case of Hathifushi, where the government was compelled to relocate the people of Hathifushi to Hanimaadhoo when the island was inundated by tidal waves in 2007. The Ministry of Environment had stated that “the living conditions of Hathifushi had [become] so bad because of the recent tidal waves that had struck the island,... that it was no longer safe for residents to live [there].” The Atolls Ministry also made statements that 250 Hathifushi residents were to be relocated to Hanimaadhoo, however this was to be a temporary solution, undertaken upon the request of the residents of Hathifushi (Haveeru Daily, 2007).

In certain cases (depending on the specific vulnerabilities) relocation would be impossible within the Maldives, as half the land of the Maldives would be lost as a result of a 1 metre sea-level rise and the remaining half would be vulnerable, as it would be 1 metre above sea-level (Delft Hydraulic Laboratory, 2001). Outmigration to other countries would be the only solution for many small oceanic islands (IPCC, 1990:-53–54).

Change in sea surface temperatures and coral bleaching

Coral bleaching is a process where healthy corals lose their symbiotic algae (Hoegh-Guldberg, 1999). The national oceans and atmospheric administration (NOAA) describes coral bleaching as a process which occurs when the water is too warm or too cold, which causes the coral to expel the algae (zooxanthellae) which lives in the tissues of the coral making the coral turn white in color. This is referred to as bleaching of the corals. These corals are not dead and can survive in favourable temperatures.

Since the devastating El Niño in 1998, marine biologists in the Maldives have been particularly concerned about the impacts on the local marine environment. The Marine Research Centre is trying to undertake measures to develop defenses against similar processes. However, since 2015 was the warmest year on record, by September 2015, corals in the Maldives were severely bleached, which indirectly affected the local tourism.

Disease

It has also been identified that climate change has implications for potential outbreaks of vector borne diseases, as identified in the Maldives’ First National Communication to the UNFCCC in 2001, and the NAPA process in 2006. Climate related diseases, such as dengue and scrub typhus, are major public health concerns. In December 2006, the country had its first outbreak of Chikungunya, another climate related vector-borne disease. The NAPA projects that the incidence of these vector-borne diseases in the Maldives will increase with climate change, particularly changes in temperature and rainfall regimes (UNFCCC, 2010).

6.1.4 Environmental degradation

In addition to climate change, scarcity and pollution of freshwater resources, beach erosion, air pollution, biodiversity conservation, and waste management are just some of the major environmental issues identified by the government in the NAPA in 2006 (Government of Maldives, 2006). Local communities were most concerned with ground water pollution, particularly around their wells, which they believed impacted their health and diminished their quality of life (Shafeega et al., 2006).

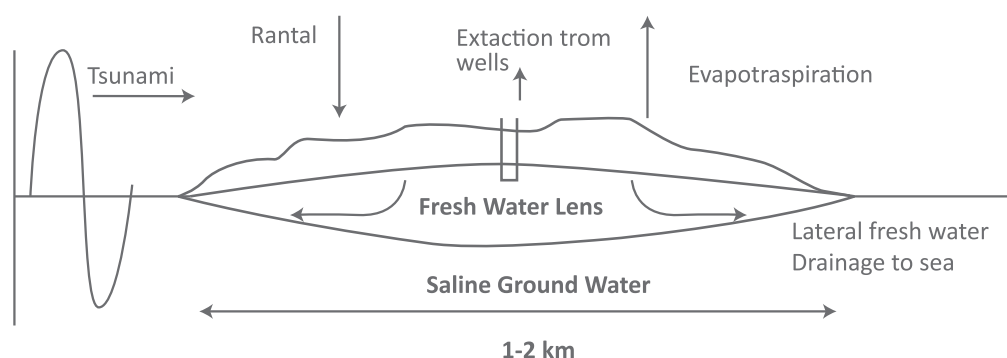
Fresh water security

The majority of islands in the Maldives do not have a functioning water supply and distribution network that can ensure sufficient safe freshwater during dry periods, except for in Male', Vilingili and Hulhumale', which are home to over a third of the total population (Lubna, 2012). Freshwater security is a pertinent emerging issue. As a result of climate change, rainfall has been erratic and consequently communities have had to manage with saline groundwater. It is also due to these prolonged dry periods that islands have experienced severe shortages of drinking water, thus calling for an emergency water supply. A sustainable solution to the annual water crisis is being discussed at a policy level. Currently, the National Disaster Management Centre provides an emergency supply of water to islands every year during the dry season (Lubna, 2012). The 2014 water crisis in Male, caused by a fire at the Male' water treatment centre, which led to water supply being cut off from households for more than a week, caused distress to the city affecting more than 150,000 people, highlighting the lack of freshwater in the Maldives as a major hazard.

Tsunami

Although Tsunamis do not take place as a consequence of climate change but rather due to geophysical reasons, they still contribute to environmental degradation in the country. The single largest natural disaster to impact Maldives in recent history was the Indian Ocean tsunami of 2004, which internally displaced a large number of people. The islands that lie in the eastern side of the archipelago are more prone to Tsunamis than the islands in the west, east and north of the archipelago. Since the year 1816, documents show that the Maldives was hit by 3 earthquakes and has experienced 85 tsunamis.

The earthquake that originated 30 km below the sea floor off the coast of Sumatra, Indonesia, on the 26 December 2004 displaced more than 30 cubic kilometres of seawater and formed the most devastating tsunami recorded in recent history, causing immense damage in multiple countries (UNDP, 2006). Part of its impact on the Maldives was an increased salt-water intrusion in the ground water lens, significantly impacting the national agricultural sector. All the fruit trees and crops died due to saline water in the flooded area. The salt also leached into the soil making it non-receptive to plant life. The impacts of the 2004 tsunami on agriculture were studied by Food and Agriculture Organization (FAO) experts in 2005 who assessed soil salinity levels. They found that the easterly monsoon had brought more than 150 mm of rainfall, reducing the salt content in the soil, however it took longer to drain out the salt from the soil in the northern islands, where rainfall is less than in the south (Food and Agriculture Organization, 2005). Around 50 per cent of the cultivable area of the inhabited islands was destroyed due to salt intrusion. Breadfruit, mango, betel leaf, guava and water apple trees were uprooted by waves or died due to salt intolerance (Red Cross, n.d).

Figure 29a: Typical hydrology of the Maldives**Typical Island Hydology of the Maldives**

Island Hydrology of Maldives. © (Photo: <http://reliefweb.int/report/maldives/maldives-post-tsunami-agriculture-brief>)

Beach erosion

More than 97 per cent of the inhabited islands of the Maldives and 45 per cent of the tourist resorts reported beach erosion in the year 2004. With rising sea-levels, the process of coastal erosion will intensify. Beach erosion and build-up are natural processes but they can be impacted by human action, making erosion more severe. The beaches in the Maldives change as a result of the two monsoons. During the southwest monsoon, the waves and wind come from the west and southwest, shifting the sand on the beach, which sometimes results in the build-up on the eastern side of the island. During the northwest monsoon the reverse happens with the waves and winds coming from the northeastern side and the sand building up on the western side. In some island communities, a cause for concern is dredging harbors and reclamation of lagoon areas for island expansion (Cambers, et al., 2006).

Sectoral impact of climate change and environmental degradation

Tourism accounts for 34 per cent of the GDP of the Maldives, more than any other economic sector (Shareef et al., 2015). As an industry that is dependent on the natural beauty of the Maldives, its vast sandy beaches, coral reefs and crystal clear waters, any impact on the environment or the climate would be devastating to livelihoods and, at the macro level, to the country's economy. While sudden onset disasters cause an immediate reduction in the number of tourists (as seen following the tsunami in 2004), the impact of slow onset disasters is not as evident, although baseline assessments illustrate the extreme vulnerability of this sector (Shareef et al., 2015). Sea-level rise and related beach and coastal erosion, rising temperatures, coral bleaching and salinity intrusion have already been reported to directly and indirectly affect tourist resorts in the country (Government of Maldives, Ministry of Environment and Energy, 2015a).

Similarly, the fisheries sector, which is the second largest industry in the Maldives, is also deeply affected by the impacts of climate change and environmental degradation. The fisheries sector was the dominant sector in which the majority of people worked until

1985, when the expansion of tourism offered additional occupational opportunities. Nevertheless, the fisheries sector still provides an income to around 20 percent of the population, with around 22,000 of people involved in fishing activities as a full time occupation (FAO, 2009). In this context, analysing the impact of climate change on this sector is relevant to understand the impact on livelihoods of a major part of the population.

Marine ecosystems are a chief asset of the national economy, and stand to be affected by climate change. Tuna fisheries are the most common fisheries in the Maldives but, as tuna is a migratory species, the fish may flock to more favourable conditions should there be a change in ocean temperatures. Climate change would likely bring a decline to the fishing industry, an industry that contributes to more than 7 per cent of the GDP, if fisher people lose their fishing grounds. The fisheries catch almost 150,000 tons of tuna every year with fish exports valued at USD 88 million. The ability of the Maldives to manage its fisheries is crucial to sustain livelihoods and social and economic well-being (UNFCCC, 2010).

While fishing was the main traditional occupation in the islands, there has been a shift in recent years to non-fishing occupations. Fishing revenue is reducing and the total number of recorded catches has been declining across the country. This fact, combined with increasing prices for fuel, craft and gear, may deter individuals from fishing. Unlike other jobs, where salary is guaranteed, fishermen are awarded only on delivery and sometimes there can be poor catches for several consecutive months. There are now more attractive and less physically demanding occupations available, such as working in tourist resorts or in Male'. This could discourage people from fishing and act as an incentive to migrate to areas with better job prospects (FAO, 1991).

Case study - Status of beach erosion

13 January 2013: It has recently come to light that 15 islands have seen drastic erosion of shores due to climate change, and people from three of these islands need to be migrated to other islands. The "Statistical Year Book" updated and published by the Planning Department last Thursday shows that at the end of 2011, fifteen of the 191 inhabited islands had faced severe erosion. The people of the islands affected worst were changed to other islands. People of Haa Alif Hathifushi were migrated to Haa Alif Hanimaadhoo while Laamu Kalhaidhoo people were migrated to Laamu Gan and Gaafu Alif Dhiddhoo people were migrated to Gaafu Alif Gemanafushi. Baa Atoll is the worst affected out of all 20 atolls where three of the 13 islands are facing severe erosion. Two islands in Haa Alif Atoll and two from Meemu atoll are also facing the problem while islands in atolls Haa Dhaalu, Noonu, Lhaviyani, Alif Alif, Vaavu, Meemu and Gaafu Dhaalu are also facing the dangers of erosion. With island heights averaging at about 1.5 above sea-level, Maldives tops the list of countries facing the dangers of sea-level rise. People of two houses in Noonu Holhudhoo were forced to abandon their homes and move to other houses last year. Those two houses now sit in the sea. There is much talk about the dangers of climate change, but little action is seen to be taken.

6.2 MIGRATION TRENDS IN THE MALDIVES

Existing literature shows that there is a high rate of internal migration in the Maldives, coupled with a large number of immigrants that the country attracts. Mobility trends also include the relocation of displaced people after disasters and nomadic/seasonal

movements. These flows are largely motivated by economic factors, and the impact of environment or climate change is not immediately evident.

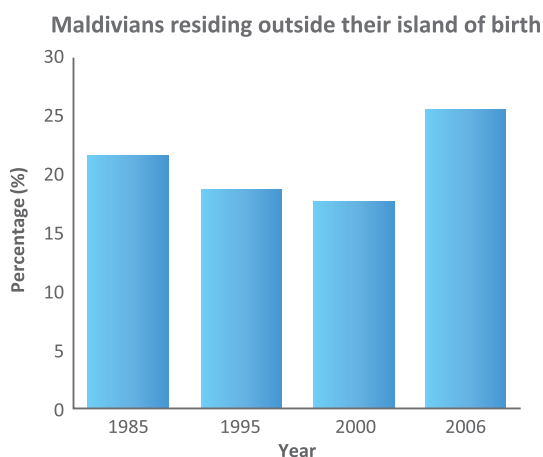
6.2.1 General trends

Internal migration trends

The existing literature on migration trends in the Maldives has not resulted in any solid findings on internal migration trends and patterns.

In 1985, over 22 per cent of the resident Maldivian population was enumerated outside their island of birth. This figure decreased to 19 per cent in 1995 and to 18 per cent in 2000, however it spiked to 26 per cent in 2006 (Mohamed, 2000). These figures show an increase in internal migration, which is likely to continue increasing in the future, as people seek better job opportunities and other facilities outside of their islands (Government of Maldives, National Bureau of Statistics, Ministry of Finance and Treasury, 2006).

Figure 30: Maldivians residing outside their island of birth

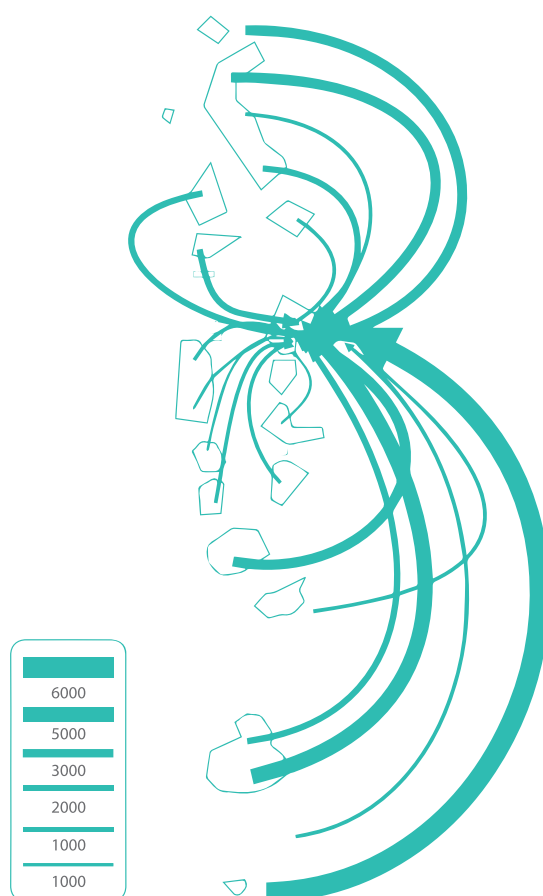


The capital city Male' attracts most of the internal migration flows. Inbound migrants from other islands are estimated to have made up 48 per cent of Male's population in 2006; their major causes for migration were identified in the census analysis report as: (1) to seek better education facilities; (2) to find employment; and (3) to live on the island or with family (Mohamed, 2000). Until recently the only secondary education provider was in Male'. In 1989, 42 per cent of enrolment in schools in Male' were atoll children from other islands. In 55 per cent of these cases, the parents had also migrated to Male', and sought employment mainly in the civil service resulting in an addition of 33 per cent to the population of Male' during the same year (UNESCO, 2000). Between 1974 and 1990 Male's population increased from hosting 13 per cent of the total population, to 26 per cent. This influx of people has made Male' one of the most densely populated islands in the world (UNESCO, 2000). The census analysis report accounts for migration within the country but does not capture international migration trends outside the country, nor the consequences of these migrations.

The diagram below taken from the census analysis in 2006, shows the influx of people to the city of Male' from the whole of the Maldives in 2006 (Government of Maldives, National Bureau of Statistics, Ministry of Finance and Treasury, 2006: 49). That year, most

of the migration occurred from the southernmost atoll (which is at the bottom of the diagram) to Male'. The figure 6,000 represents 12 per cent of the migrant population from Seenu Atoll, followed by 5,000 from Gaafu Dhaalu Atoll. A total of 3,000 migrants moved from up north Haa Alif and Haa Dhaalu and Thaa atoll respectively in the south to Male' as well. The migrants from these three atolls represent 8 per cent of all the migrant population during this period. Figure 31 depicts migration streams to Male', indicating the inter-connectedness of the islands, in terms of internal migration.

Figure 31: Lifetime migration streams to Male' 2006



International migration

In terms of immigration, Maldives receives a large number of migrants from South and South-East Asian countries. It is primarily a destination country for migrant workers from Bangladesh and to a lesser extent, India, Nepal and Sri Lanka. Around 116,000 migrant workers are currently working in the Maldives (Merret, 2015) primarily in the construction and service sectors, and the tourism industry. These numbers may be higher as they do not include irregular migrants.

6.2.2 Labour migration within the Maldives

The occupational patterns of the islands are such that islanders rarely practice one occupation alone. People take up multiple occupations, often simultaneously, depending on the season, resource availability, market prices and skillsets.

Seasonal migration of fisherpeople

Fisherpeople, who are mainly involved in yellow fin tuna fishing, follow the migratory species and migrate to fishing grounds in big fishing vessels, leaving their families at home. This can be compared to nomadic lifestyles. Typically, the men travel and live in the fishing vessels and return home after they catch and sell their fish to nearby buyers. Yellow fin tuna or 'Reedhoo Uraha Kanneli' as referred to in the Maldivian Language, is the second most important species of fish caught in the Maldives. The Maldivian yellow fin tuna fishery is primarily a live-bait hand line industry. Fisherpeople usually spend around 4–5 days at sea before they catch the required amount of fish.

Seasonal migration to seek employment in the resorts and Male'

The tourism sector provides a lot of employment opportunities and many Maldivian men are drawn to working in tourist resorts. Similarly, Male' offers more employment opportunities in general, both in the civil sector and the private sector, given the larger job market. The working environment is such that employees stay on the resort islands or in the capital and return home to their families once a year for their annual holidays. A study undertaken in 2006 of 89 resort islands showed that 18,257 people were employed, 9,886 of which were locals and 8,371 of which were foreigners. Of the 9,886 local employees, only 580 were women, indicating that they were less likely to migrate when compared to men (Government of Maldives, Ministry of Tourism and Civil Aviation, 2008).

Immigration to the Maldives

The Maldives also receives a large number of expatriate workers annually, a large number of which are undocumented, who find work in all employment sectors. The immigrant population contributes to the professional, as well as the non-professional sectors. The latest figures estimate the presence of 116,000 migrant workers in the country (Merret, 2015). The lease agreement for the development of tourist resorts requires that a specific ratio for foreign employees to local staff be maintained, however these figures have not been adhered to and authorities have not been monitoring the numbers of expatriate workers (Human Rights Commission of the Maldives, 2009).

6.3 THE CLIMATE CHANGE, ENVIRONMENTAL DEGRADATION AND MIGRATION NEXUS

The relationship between climate change and migration has been included in IPCC assessments and the IPCC's First Assessment Report (AR1) mentions relevant inter-linkages between climate change vulnerabilities in human settlements and corresponding human migration potential on few occasions, however these references are growing. Preliminary research conducted by Speelman (2015) found that Maldivians express an interest to migrate and to live in less vulnerable islands in terms of climate change-induced disasters, however these findings are yet to be substantiated.

The IPCC identifies the most vulnerable settlements to be those especially exposed to natural hazards, and the most vulnerable populations as "those in developing countries, in lower income groups, residents of coastal lowlands and islands, populations in semi-arid grasslands, and the urban poor in squatter settlements, slums and shantytowns, especially in megacities" (IPCC, 1990:3; IPCC, 1992:55, 89). It has stated that in small island nations

inundation due to sea-level rise and storm surges could lead to significant movements of people, which could in turn initiate larger migrations which, over a number of years, will lead to severe disruptions of settlement patterns and result in social instability in some areas” (IPCC, 1990:3; IPCC, 1992:55, 89). Migration as a long-term adaptation option is discussed in the fifth assessment report of IPCC but it also notes that due to financial and legal barriers, migration on a large scale is unlikely. The question of desirability of migration as an adaptation strategy has also been raised (IPCC, 2015). Despite this and though the evidence on sea-level rise is still scant, studies also show that the costs for adaptation on islands is deemed too high to be economically feasible, lending support to the idea of migration (Climate and Development Knowledge Network, n.d.:22). Migration may, however, provide an opportunity to adapt to new environmental realities (IOM, 2014a).

6.4 DISPLACEMENT AND PLANNED RELOCATION FOLLOWING THE 2004 TSUNAMI

After the 2004 tsunami many people were displaced and temporary housing was provided for them. In 2005, with the assistance of the International Federation of the Red Cross and Red Crescent, the Government of Maldives embarked on constructing temporary shelters. Houses were reconstructed according to specific island characteristics and were built in safer locations, less vulnerable to the risk of storm surges. In cases of elevated damage, where rebuilding would prove unsustainable in the long-term, all of the island residents may have to relocate to other islands (Red Cross, n.d). The National Recovery and Reconstruction Plan has stated that the “resettlement and relocation of populations is totally demand-driven and voluntary” and as such the relocation after the tsunami has been on a voluntary basis (Red Cross, n.d).

After the 2004 tsunami, the Government of Maldives introduced the “Safe Island Concept”, which aimed to reduce the damage from future natural disasters by enhancing coastal and natural protection. The safe islands were chosen as host islands under the tsunami relocation program. The safe island concept was implemented in two islands namely Dhuvaafaru and Vilifuishi where people were relocated after the tsunami. Additionally, the “Safe Islands” would also provide housing for small communities in remote islands (National Disaster Management Centre, 2013; Seeds Asia, 2008).

6.5 EXISTING POLICY DIRECTIONS AND INSTITUTIONAL ARRANGEMENTS ON CLIMATE CHANGE, ENVIRONMENTAL DEGRADATION AND MIGRATION ASPECTS

Existing policy frameworks to address climate change and environmental challenges

The President of the Maldives ratified the Disaster Management Bill on 06 September 2015. Paragraph 7.(1) of the Act states the following: 7. (1) For the purposes of this Act, there shall be established an Atoll Disaster Management Authority and an Island Disaster Management Authority, in all atolls and inhabited islands of the country. The act also contains provisions for the development of disaster management plans for every island, which include island risk assessments relating to issues such as sea-level rise.

Thaa Atoll Vilufushi, Safe Island Concept

Th. Vilufushi is one of the islands that was severely affected by the Tsunami that hit Maldives on the 26 December 2004. The island was destroyed by soil erosions, and the entire infrastructure, including more than 90 per cent of housing was destroyed. Given the strategic location of the island in the atoll and the request by the original community to be resettled on the same island, it has been decided that this island will be redeveloped as a “safe island” with a growth centre at the northern tip of the atoll. Due to its small size and the unavailability of land on the island for further growth, it has also been decided that reclamation would be carried out to increase the landmass to cater for sustainable growth, as well as to attract people from other small islands, which in turn would support the population consolidation policy.

Extensive consultations were carried out prior to, during and after the proposed land use plan was drafted. Consultations were carried out with Government ministries and other relevant bodies and the Vilufushi community. The land use plan consisted of residential and service areas in the island. The environmental protection zone and conservation areas were designed as follows:

Environmental Protection Zone

A 40-metre wide EPZ, consisting of a 20-metre wide raised area (1.4-metre above mean sea-level) with revetment on the outer edge and a 20-metre wide drainage area, was provided around the island, most prominently on the eastern side facing the outer reef side.

Conservation Areas

- As a reminder of the destruction caused by the Tsunami and to preserve some features of the old island (like coral masonry, which will become very rare, if not, nonexistent on the island in the future), an area has been allocated for conservation, which will retain some of the damaged structures;
- Green Belt: Existing vegetation along the periphery of the old island has been conserved;
- The shape and orientation of the original island was preserved;
- Preserving majority of the trees left on the island, which, if made into a residential area would have to be cut down to accommodate housing construction;
- The existing cemetery on the island, which consists of a “shrine”, a mosque and a burial ground, was to be conserved.

The above requirements were designed as an important adaptation strategy from Tsunamis and of the climate change impacts and vulnerabilities especially sea-level rise and beach erosion. The island is designed by elevating the height of the island to protect from sea-level rise, storm surges and other hazards. The green belt near the shore line is protected as an adaptive measure to defend the island from the impacts of beach erosion and other hazards. One of the other objectives was to retain the old infrastructure and reduce cutting down trees which would otherwise act as protection for the island in many ways.

International policies: The Sustainable Development Goals of the United Nations have addressed climate change in Goal number 13.

- Goal 13** Take urgent action to combat climate change and its impacts.
- 13.1** Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
 - 13.2** Integrate climate change measures into national policies, strategies and planning
 - 13.3** Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning change.
 - 13(a)** Implement the commitment undertaken by developed-country parties to the UNFCCC to a goal of mobilizing jointly USD 100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.
 - 13(b)** Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and Small Island Developing States, including focusing on women, youth and local and marginalized communities.

The Maldives being an island state needs to develop policies and procedures to strengthen the resilience and adaptive capacity of the people living in the islands, as a survival measure in the near future. Maldives also needs to raise awareness as a key ingredient of adapting to climate change impacts, and integrate measures into national, regional and local level policies and strategies. This requires a collaborative effort from the United Nations family in terms of providing the technical expertise to support the Maldives to achieve the SDGs.

Regarding the position of Maldives on the climate change aspects of the SDGs, Ambassador Sareer made the following statement at the eleventh session of the United Nations General Assembly Open Working Group (OWG) on Sustainable Development Goals (SDGs) at the United Nations' Headquarters in New York in 2015:

The Maldives position is that Climate Change should remain a focus area till the Goals are elaborated, and thereafter targets explicitly relating to climate change should be included for all goals. Maldives held the firm position that there was a need for quantitative targets that keep every Member State bound to hold the increase in the average global temperature at 1.5 degrees Celsius.

This frames the context in which Maldives has thus far acted on climate change issues. The next section will examine the different policies of the Government in the last 35 years.

On 25 September 2008, Maldives called for a “rights-informed” approach to tackling global warming and climate change by submitting a paper to the United Nations High Commissioner on Human Rights on the relationship between human rights and climate change, as stated in the Human Rights Council Resolution 7/23. The Maldives paper focused on the impacts of climate change on the residents of the Maldives from a human rights perspective, which included the right to health, water, food and adequate housing and other livelihood aspects.

The Government of Maldives has also been advocating at the international level for increased action against climate change. His Excellency Mr Maumoon Abdul Gayoom, the former President of the Republic of Maldives also advocated for the causes of climate change to be addressed, highlighting that Maldives is an endangered nation. This international advocacy has continued with successive presidents.

In the Maldives, the governmental position on climate change and environmental issues is addressed in the policy documents of the Ministry of Environment and Energy and the National Disaster Management Centre. The NAPA (2007), the Maldives National Strategy for Sustainable Development (2009), and the Strategic National Action Plan for Disaster Risk Reduction and Climate Change Adaptation (2010–2020) are some policies relevant to addressing migration in the context of climate change. These policies have identified a need for a legal basis for the respective institutions to implement the identified actions. The climate change policy of 2015 identified the need for establishing an institution called Climate change and Sustainable Development, to provide coordination and an oversight function in order to implement the new climate change policy.

The Maldives climate change policy framework was launched on the 10 August 2015 and aims to improve climate change and development information for the Maldives, as well as strengthen the use of such information and knowledge in decision-making. The climate change policy encompasses five goals:

POLICY GOAL 1

Ensure and integrate sustainable financing in climate change adaptation opportunities and low emission development measures;

POLICY GOAL 2

Strengthen a low emission development future and ensure energy security for the Maldives;

POLICY GOAL 3

Strengthen adaptation actions and opportunities and build climate resilient infrastructure and communities to address current and future vulnerabilities;

POLICY GOAL 4

Inculcate national, regional and international climate change advocacy roles in leading the international negotiations and awareness raising in cross-sectorial areas in favor of the most vulnerable and small island developing States;

POLICY GOAL 5

Foster sustainable development while ensuring security, economic sustainability and sovereignty from the negative consequences of the changing climate.

In the current policy documents of the Ministry of Environment and Energy (MEE), adaptation strategies are discussed, however migration has not been mentioned explicitly in any of the documents. In the new climate change policy framework adaptation is linked to sustainable development issues. However there is scope to introduce adaptation measures and create awareness of environmental degradation and its impacts in relation to the movement of people as a strategy. In this context, IOM has developed a National Plan of action to be incorporated into the policy documents, such as the National Adaptation Plan of Action, which is being developed by MEE.

Existing policy frameworks to address migration and population settlement in the context of climate change

Currently, no legal instruments exist which address issues related to climate change and migration. Internal migration and international migration are determined by the population consolidation policies of the previous governments, however the current policies of the government are embedded in the Progressive Party of Maldives Manifestos. There is no explicit policy to address either internal or international migration. Some of the approaches to address this issue taken by different governments that have come into power since 2004 are outlined below. With the change of governments, the relevant policies have changed to take on different strategies and approaches to tackling issues of population movement and climate change. When formulating these policies, an evidence-based approach should be adopted by the respective governments. This has resulted in a drastic change of programs and the premature termination of others, such as the discontinuation of land reclamation projects in some sites.

The Population Consolidation Policy of the Maldives

Despite the lack of policies to address the MECC nexus, some existing policies can be seen as applicable in this context. In this regard, the Population Consolidation Policy (PCP) is important, as it has been described as an adaptation strategy in the Government's 2007 NAPA and in the recent climate change policy framework. The relevant MEE report states that:

Coastal protection: The islands of the Maldives are low lying and beach erosion is widespread causing significant loss of land and coastal infrastructure. Priority is given to protect the human settlements and infrastructure of inhabited and resort islands. Facilitate and continue to invest in coastal protection of inhabited islands and resorts. Include land elevation, shore protection and reclamation as an adaptation measures to increase resilience of vulnerable islands (MEE, 2015).

These policies have been created in response to entire populations being relocated from islands when their livelihoods became no longer sustainable; as can be seen following the 2004 tsunami when populations of various island communities had to be resettled (Arnall and Kothari, 2015).

PCP was a policy that was developed by former President Maumoon Abdul Gayoom in July 2004. The policy promotes the creation of five regional hubs (North, North Central, South, South Central and Hulhumale') which would relieve the population pressure from the capital Male'. To complement this initiative the policy encourages smaller communities to migrate to more spacious islands with larger populations to create new urban centres. Such communities were provided with housing and other benefits.

Even though this policy does not directly reference climate change, it can be viewed as addressing its impacts. The Government of the Maldives has noted that it had adopted the NAPA "to address the challenges posed by environmentally vulnerable islands, that are currently experiencing severe impacts from climate change and associated sea-level rise, with remote and dispersed population" (Mayer, 2011). While consolidating populations on less inhabited islands will increase the safety of the population, adaptation remains a very great challenge in the Maldives as a whole (Mayer, 2011). As such, housing and infrastructure development programs are undertaken to incentivize people from smaller

communities to move to bigger and more spacious islands with larger populations and the ability to better provide necessary facilities. Like other adaptation strategies, planned relocation is a way for communities to cope with changes in environmental conditions.

Policy of President Nasheed on Population consolidation: Former President Mohamed Nasheed, who succeeded president Maumoon, implemented a policy with regard to population consolidation and the relocation of communities. In 2009, a cheap ferry system between islands within the atolls was developed enabling people to travel with more convenience and conduct economic trade, instead of the permanent relocation of small communities. The ferry system is still in operation today.

Policy of President Yaameen on Population consolidation: The policy of the current president emphasizes voluntary migration of people from small and vulnerable communities, who are affected by environmental degradation and other physical and social vulnerabilities and thus, in a local press conference on the 10 March 2015, he stated that 75 per cent of the total Maldivian population can be settled in Hulhumale'. President Yameen indicated that the second phase of the Hulhumale' project would be developed with a view to relocating youth and their families from smaller islands to be closer to the capital. Developing this notion, President Yameen said that housing facilities would be established, and further reiterated the Government's commitment to providing an affordable social housing scheme to all employed youth. (Press release by The President's Office of the Republic of Maldives, 10 March 2015 Ref: 2015/85).

Institutional arrangements to address climate change, environment and migration

There is no one institution assigned to address climate migration; instead there are many institutions working on climate migration. The responsibilities relating to climate change and migration falls under the mandate of different institutions, as per the table below.

Table 20: Institutional arrangements relating to MECC in Maldives

The Ministry of Environment and Energy (MEE)	Implements most of the environment projects and formulates climate change policies, and strategic decisions. Coordinates climate activities. Oversees the Climate Change Department and Energy Department of the Ministry.
The Ministry of Tourism, Arts and Culture	Implementing agency for projects aimed at increasing the resilience of the tourism sector to impacts of climate change.
The Ministry of Economic Development	Has a mandate to facilitate private sector investment in the country.
The Ministry of Fisheries and Agriculture, and the Marine Research Centre	Monitors the impact of climate change on coral reefs and fisheries.
The National Disaster Management Centre (NDMC)	Takes proactive and timely measures to prevent or reduce the impact of disasters on the Maldivian people and the economy. NDMC operates under the Ministry of Defense and National Security Services, Ameenee Magu.
Maldives metrological services	Provides timely metrological information to minimize the impact of natural disasters on life and property. The metrological department is under the Ministry of Environment and Energy.
Department of Immigration and Emigration	Control and manage the border to ensure the legal entry of people to Maldives. Coordinate with relevant government agencies to ensure that immigrants comply with laws and regulations of the Maldives. Provide a secure and trustworthy international identification system for the citizens of Maldives for international travel.

Source: Transparency Maldives, 2013

The MEE is designated as the focal point and coordination cell for climate change. In addition, other government ministries and departments are also involved in implementing climate change adaptation activities. United Nations agencies, such as UNDP work with MEE. The NDMC and NGOs such as the Red Crescent Society of the Maldives, address rapid-onset disasters.

Even though Maldives has been at the forefront of advocating for action against climate change at the international level, the existing institutional set up (as per the above table) at the national level is not sufficient to cope with the climate change and natural hazards that the Maldives faces. The current activities at the national level and at the community level are carried out in a fragmented manner, with different activities carried out by different government institutions and NGOs, each with a different purpose and intent. The conflicting mandates of the respective institutions, added to the uncoordinated activities undertaken, have gained Maldives an unfavourable international reputation with regard to climate change. Some opportunities have been missed out due to the overlapping mandates of different institutions.

The MEE is mandated to take the lead on climate change related policy formulation and the implementation of climate change activities, as well as coordinating the climate change activities of other ministries at the national level. However, at the regional and island level, Maldives has faced a lot of changes in governance. A Decentralization Act, passed in April 2010 and ratified in May 2010, established the current administrative divisions and paved the way for the first local council elections in the Maldives. In February 2011, 188 Island Councils, 19 Atoll Councils and 2 City Councils were established and representatives elected. The Act mandated the creation of the Local Government Authority (LGA), which was established in late 2010. Under the Act, Island Councils are accountable to Atoll Councils and Atoll Councils are accountable to the LGA. The decentralization process is in its infant stages and is yet to be demonstrated as a positive development for climate migration.

It is also relevant to describe the role played by the LGA. The LGA is responsible for ensuring that these policies, designed at the national level, are translated into the island development plans, which are to be implemented by the island councils. The mandate of the LGA, created by the President in 2010 under the Act on Decentralization of the Administrative Divisions of the Maldives, is as follows:

- Monitor to ensure that the work and activities of councils created under this Act is functioning in accordance with the Constitution, Act on Decentralization of the Administrative Divisions of the Maldives, and other Laws;
- Coordinate the work of the councils at the national Level;
- Perform all other work mandated to the Local Government Authority under the act on Decentralization of the Administrative Divisions of the Maldives;
- Monitor and work towards maintaining similar standards for the type of work, activities, and regulations formulated by the different councils;
- Formulate operational regulations of the Authority;
- Local Government Authority is required to determine the areas that fall under the jurisdiction of every Atoll Council, Island Council and city and to demarcate these boundaries within the first year of enactment of the Act and to publish the determined areas in the gazette;

- In order to manage the Maldives in a decentralized manner, identify training needs to increase technical capacity and organize and conduct the training;
- The LGA will assist the local councils to develop their disaster risk reduction plans which will include the climate change impacts faced by the communities.

Overall despite several effective policies and measures implemented under different governments, the existing policy frameworks remains insufficient to address the issues of relocation, migration, and displacement of populations in the Maldives. There has to be a clear policy directive on the way forward with migration, relocation and displacement at the national level and an institution identified to coordinate these activities. All the relevant institutions need to make a consolidated effort to work together at the national level and try to empower governance at the community level, so that people voice their concerns and make adaptation strategies more effective in the future.

Implementation of state policy; gaps and the way forward

Gaps at the national level: The national policy on climate change has highlighted that assessments conducted for the NAPA have identified where climate impacts will likely be most severe and who among the country's population is most vulnerable. The Housing Ministry is preparing to be responsible for relocation activities when they receive directions from the Presidents' office.

Coordination has been pointed out as one of the areas that needs to be strengthened at multiple levels, both within and outside the Government and among other climate change actors, to help avoid duplication of efforts and assist in pooling the available resources. Coordination among stakeholders needs be both horizontal (e.g. among ministries and departments) and vertical (e.g. between Government, NGOs and business). However, this horizontal and vertical coordination through the government remains a challenge in the Maldives, as evidenced by the national climate change policy.

Gaps between the global, regional, national level and communities: Research shows that at the global and regional level, the impact of climate change on small developing islands has been highly considered; however these considerations have not been translated at the community level. The realities of people currently affected by climate change are not fully acknowledged when designing policies and strategies. This results in a one-way, linear transfer of knowledge from professionals to islanders, whereby the islanders or the community are imagined as having little understanding of the concept of climate change and as lacking interest to respond to emerging challenges (Arnall and Kothari, 2015). Kothari argues that "while the government of the Maldives may encourage the consolidation of the population onto a few larger islands in order to make them more resilient to future climate change, population consolidation will also reduce the costs of the provision of services to large numbers of islands." (Kothari, cited in Reed, 2013). Thus there is a gap between the views of communities and the policymakers on the issue of climate change and environmental degradation.

A study conducted by Arnall and Kothari (2015) introduces the idea of elites as professionals with scientific knowledge on climate change, and non-elites as the people who live in the communities without this scientific knowledge. They argue that there needs to be improved dialogue between the "elites" and "non-elites," particularly on issues such as climate change and migration, so as to better integrate their differing perspectives into

national policies. In the Maldives, there is some evidence of there being awareness of this necessity. During one feedback workshop an influential policymaker from an international donor organization commented that:

out of all the hundreds of workshops on climate change that have occurred in the Maldives since evidence of the problem first emerged from the scientific community in the 1980s, there has never been an event that has tried to take into account non-elite, local understandings and perspectives on the problem (Arnall and Kothari, 2015).

The Rapid Assessment of Perceptions (RAP), undertaken in the communities by Live Learn with regard to community-level adaptation of fishery and agricultural sectors corroborated this point, as they found there to be:

...limited knowledge, awareness (and action) on climate variability, future climatic changes and their likely impact on agriculture, fisheries and food security systems at large. All communities lack strong plans and communications for climate change and food security... highlighting the need for stronger links between the NAPAs and community level planning (Shafeeqa, 2011).

The policies that have been designed by the respective institutions are not evidence based and need to focus on this aspect when designing future policies on climate change and migration. This is most evident in the PCP of the Government, as it has changed over time.

A long, medium and short-term strategy for planned relocation and also for migration and displacement needs to be designed by the respective government authorities for planned movements due to climate change induced hazards and these policies to be accessible to all. Displacement and migration issues need to be included in the current climate change policy to ensure that these policies holistically incorporate human mobility issues in the context of environmental degradation and climate change. Other issues that need to be addressed include:

- Guidelines and principles for comprehensive disaster risk assessments need to be developed to identify key vulnerable sectors identified in the NAPA and other planning documents for preparing adaptation to vulnerabilities faced by the communities.
- Climate SMART building codes need to be in place, which are customized to the respective islands.
- Facilitate consultations about planned relocation as a DRR strategy with those affected, and host communities to ensure that any such move is implemented with the full participation of both relocating and host communities, and with full respect for human rights and the principles of non-discrimination. The aftercare aspects and the integration of the affected communities into the host communities need to be incorporated when designing policies for relocation.
- The newly designed policies should integrate ways of providing support and capacity building for family members left behind who are the elderly, children and particularly women who often need to take on increased workloads. Such support should include alternative livelihood training, the introduction of more efficient methods of agriculture and entrepreneur skills.

- Consider the introduction of new technologies to enhance existing knowledge and practices. These should include water security measures, preventive measures of beach erosion, mixed farming and aquaculture, crop diversification and alternative cultivation methods that increase yield and improve soil quality.
- The health and economic aspects of flooding and the major types of disasters affecting the Maldives' local population and immigrants, need to be considered when designing policies.

The intended contribution of this study and the way forward

This study considers the migratory movements of people in relation to climatic factors in the Maldives over time, in four designated sites. It documents the current evidence related to sudden onset disasters, such as: storm surges, flooding, tidal waves, and slow onset disasters, such as: coastal erosion, sea-level rise, salt water intrusion, rising temperatures, changing rainfall patterns and drought. Consequently, the study will determine the climatic factors affecting people and their migration patterns, as well as providing educated speculations as to what may transpire, in light of historical trends and movements, to assist future policy decisions.

Based on the findings, the study has also designed a model action plan, which will provide inputs for future policy directions nationally, as well as providing inputs for the design of a regional action plan. This study also paves the way for strengthening of the LGA's five year plan, which in turn, will be a guiding document when developing the island level plans in 2016. The study also demonstrates the need for additional in-depth studies on migration patterns in the Maldives to be conducted in the future, particularly studies which document climate change-related reasons for migration for future developmental purposes.

The migration trends of the Maldives have always been directed more towards the capital Male', where services and facilities are available and this trend has increased under the current policy directions of the Government on providing housing for 75 per cent of the population in Hulhumale', adjacent to the capital Male'. People usually migrate seasonally in search of livelihood opportunities, which are typically in the fishing and tourism industry and are very much male dominated industries. No documentation is available to trace people who have migrated outside the country. The immigrant population who live in administrative and non-administrative islands, work in the professional, as well as the non-professional sectors. The latest figures estimate the presence of 116,000 migrant workers in the country which contributes to around a third of the total population of the Maldives. The policies have been changing with the changing governments with regard to population consolidation, however the policy of relocating smaller populations and the communities living in smaller islands to growth centres or where larger populations have settled, has been on the agenda of all governments. However, a policy and a designated institution for climate change and migration, needs to be in place to address these issues more effectively.

6.6 RESULTS OF THE PRIMARY DATA COLLECTION MALDIVES

The Maldives country study followed an approach and methodology, similar to that of the Bangladesh to capture data at the household level. The detailed findings of the field study are set out in the following sections.

6.6.1 Demographic and socioeconomic profile of the study population

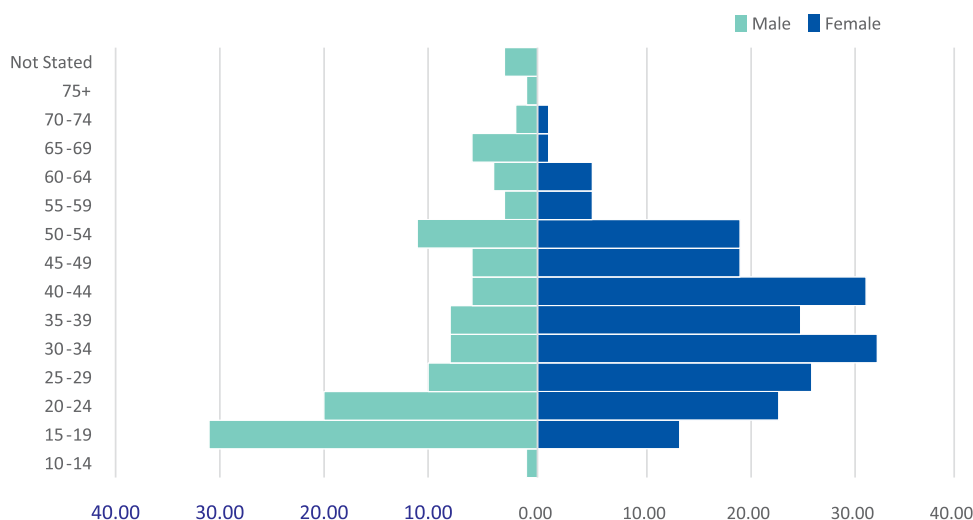
Age, gender and household status

Table 3 (set out earlier in Section 4.2.2, in the methodology of the report), shows the number of households included in the survey in the four designated sites of this study. The Male' area covers 3 islands: Male', Hulhumale' and Villimale'. There were 60 households included in the Male' sample, 60 from Hulhumale' and 20 from Villimale' respectively. Holhudhoo, Naifaru and Hanimaadhoo each covered a total of 60 households. The total household sample was 320. A list of migrant and non-migrant households was prepared by field enumerators, from the sampled urban and rural localities in the identified sites.

The survey was carried out from September to November 2015 in the selected sites. The number of migrant and non-migrant households were taken equally. In all locations except for Hanimaadhoo and Holhudhoo the migrant and non-migrant households numbers were 30 migrant and 30 non-migrant households and in Villimale' 10 migrant and 10 non-migrant households respectively.

The qualitative part of this study was based on focus group discussions (FGDs) from the four sites which comprised one men's group, one women's group and one mixed group, except for the Male' site which covered one mixed FGD. In each of the communities, five key informant interviews were undertaken and in the Male' site, 12 interviews were conducted with policymakers from the following institutions: MEE, Disaster Management Centre, National Bureau of Statistics, Ministry of Fisheries and Agriculture, UNDP, Ministry of Housing, Department of Meteorology, Maldives Red Crescent Society, Maldives National University, Department of Immigration and Emigration, Ministry of Foreign Affairs and the LGA.

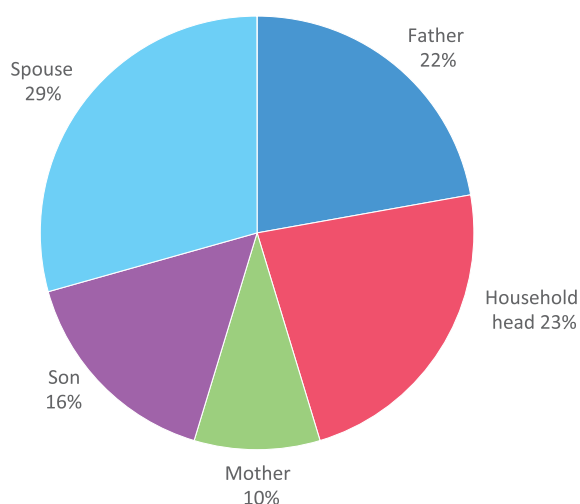
Figure 32: Population by age group and sex



The households surveyed comprise of 37 per cent male and 63 per cent females in the four study sites. Out of which 81 per cent of the household respondents were between the ages of 15 to 44 years. Only one respondent was below the age of 15 years and one above the age of 75 years. There were more female participants in the household study conducted in rural areas/in the outer atolls, because the households visited in the outer islands were mostly headed by women. However, when asked who the household head was, the women would often name an absent male member of the household, which

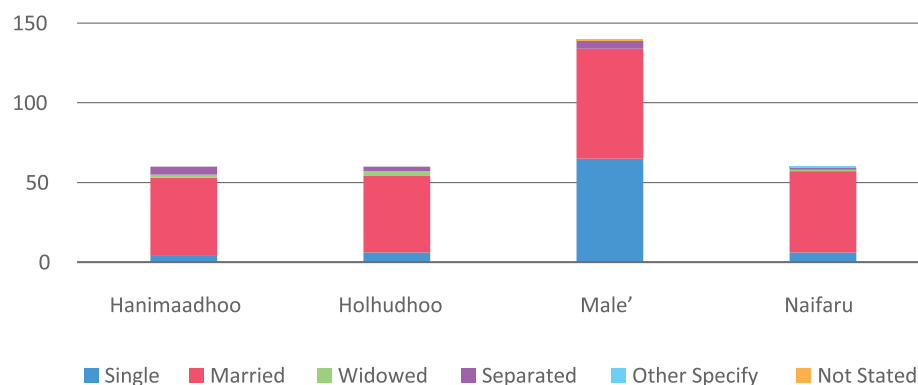
provides an indication of the way in which gender roles are perceived by household members in those study sites. These numbers are reversed in the urban areas where 62 per cent of the household respondents were male. This may be because the enumerators did the household surveys in the urban areas in the evenings and the timing of the survey might have coincided with the working males being present in the households.

Figure 33: Relationship of the household head to the respondent



Out of the household respondents in this study, 29 per cent stated that the household head was their spouse (88 females and 6 males). Twenty-three per cent stated that they were the household heads (47 males and 27 females). Fifteen per cent stated that their household head was their son. Male heads of households constituted 74 per cent of the respondents. While female heads were only 11 per cent of the households.

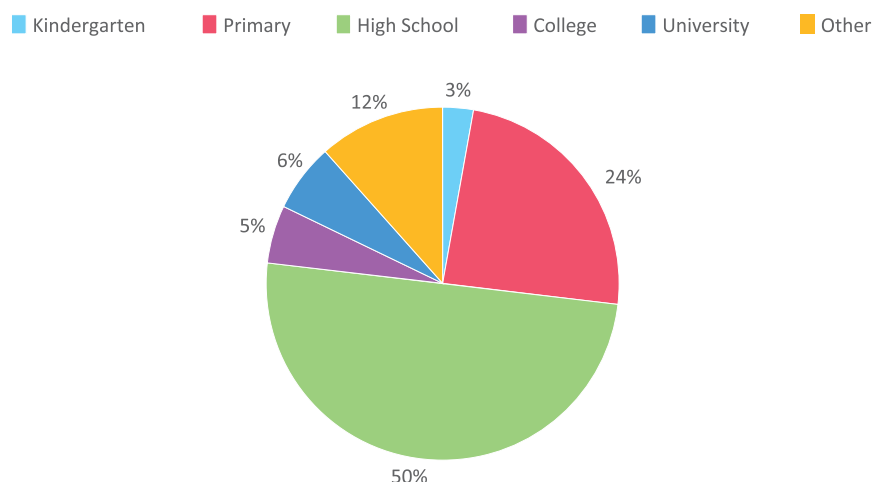
Figure 34: Marital status by locality



From the four sites surveyed, 67 per cent of the respondents in the household survey were married. Thirty-six per cent were single, while 2 per cent were widowed and 4 per cent of the respondents had separated from their spouses. The legal age for marriage in the country is 18 years of age.

Education levels

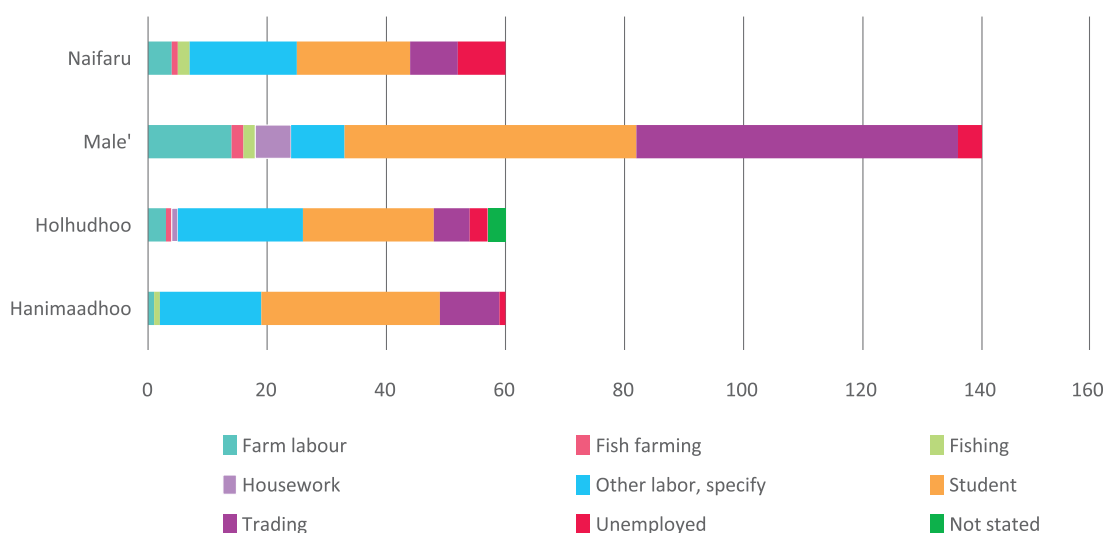
Figure 35: Education levels



Out of the 320 households surveyed, 50 per cent of the respondents attended high school. This percentage is higher in Male' and greater Male' areas compared to the outer atolls. In the Male' area, 85 per cent of household respondents had attended high school. While in the other three sites only 55 per cent, 47 per cent and 55 per cent respectively had attended high school, colleges and universities respectively. The lack of opportunities for higher education and quality education was one of the major factors pointed out by the respondents for migration to cities and other growth centres since most of the schools and universities are located in Male'. The other category in the Figure above specifies that the respondents have not attended any formal school.

Primary occupation of the respondents

Figure 36: Primary occupation of the respondents



Around 37 per cent of the respondents were students who were not working. Another 24 per cent of the respondents worked in the trading sector, followed by 20 per cent who worked in the service and tourism industry (depicted as “other” in the graph), the latter being one of the biggest employment sectors in the Maldives. Although one of the sites (Naifaru) is a fishing island, out of the 60 households surveyed there, only three households reported being involved in the fishing sector. None of the study sites are farming islands. However, six per cent of the respondents in the table above stated that they were involved in farm labour. This included home gardens or small farming plots near their households undertaken for subsistence agriculture.

6.6.2 Household characteristics

Household size

The definition of a household in the Maldivian context for this study is defined according to the Census Analysis 2006 report (Government of Maldives, National Bureau of Statistics, 2014). From the table below it can be seen that 74 per cent of households had 1–3 boys under the age of 18 years and 84 per cent of the households had 1–3 girls under the age of 18. Fifty-six per cent of households had 1–2 men of working age (18–65 years) and 50 per cent of the households had 1–2 women of working age. Men and women above the ages of 65 comprise only a very minimal percentage.

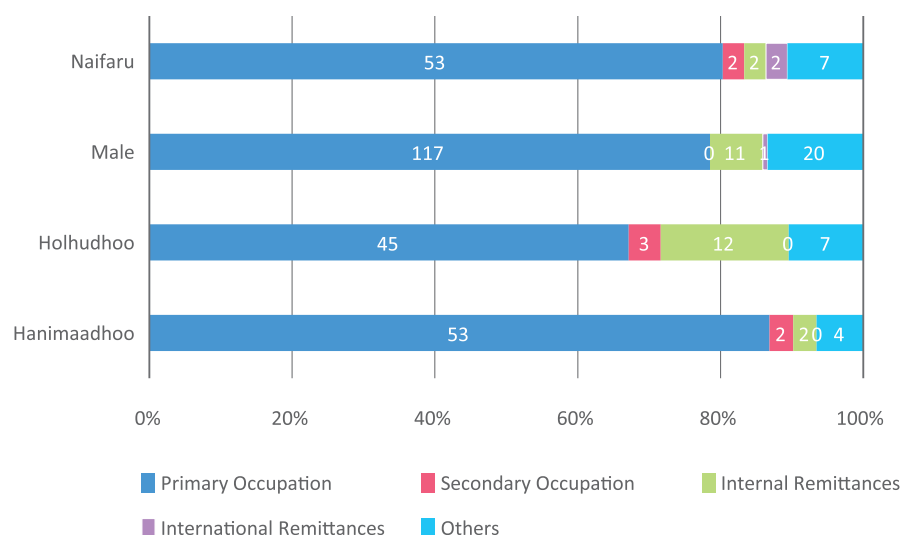
Table 21: Household by size and composition

Sex	Island				Sex	Island			
	Hani-maad-hoo	Hol-hudhoo	Male'	Naifaru		Hani-maad-hoo	Hol-hudhoo	Male'	Naifaru
Adult Men (aged 18-65)	60	60	140	60	Adult Women (aged 18-65)	60	60	140	60
0	20	24	56	16	0	21	25	71	18
1	21	23	52	25	1	28	21	47	25
2	15	7	22	15	2	10	9	10	12
3	2	2	5	2	3	1	2	7	5
4	0	1	1	1	4	0	2	2	0
5	1	0	3	0	5	0	0	2	0
Blank	1	3	1	1	7	0	0	1	0
					(blank)	0	1	0	0
Boys (<18)	60	60	140	60	Girls (<18)	60	60	140	60
0	2	4	7	6	0	1	1	8	2
1	22	18	39	16	1	16	21	49	18
2	19	14	30	21	2	21	20	47	24
3	8	7	37	7	3	14	11	20	10

4	7	6	10	8	4	7	4	10	3
5	1	7	9	1	5	0	2	1	2
6	0	2	1	0	6	1	0	5	0
7	0	1	5	0	7	0	1	0	1
8	0	0	1	0					
Blank	1	1	1	1					
Elderly men (>65)	60	60	140	60	Elderly women (>65)	60	60	140	60
0	50	55	130	45	0	55	48	129	46
1	9	4	9	12	1	5	11	11	13
2	1	0	1	0	2	0	1	0	1
3	0	0	0	1					
Blank	0	1	0	2					

Major sources of income

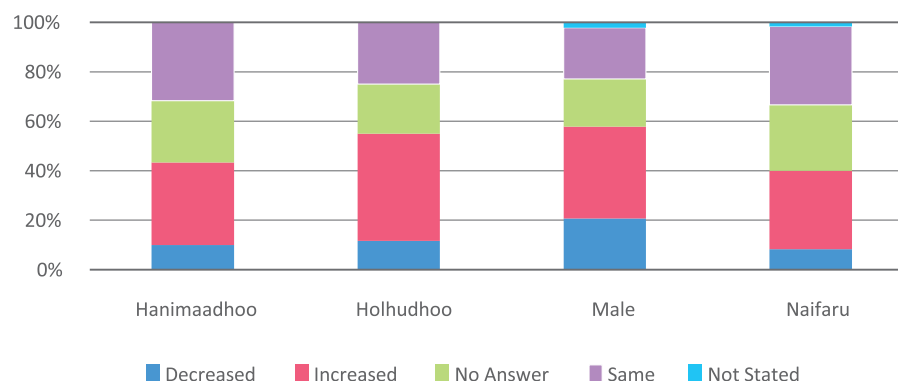
Figure 37: Major source of income



Out of the total number of households surveyed in the four sites, 84 per cent stated that they rely on primary occupation such as fishing for their livelihoods. Almost 2 per cent stated that they rely on a secondary occupation. Eight per cent rely on remittances sent by a family member who worked outside the home (in other locations within the Maldives) and 0.9 per cent relied on international remittances: since Maldives is a labour receiving country unlike Nepal or Bangladesh, the household remittances come from internal sources rather than international sources. Finally, 11 per cent of the respondents stated that they relied on other sources of income.

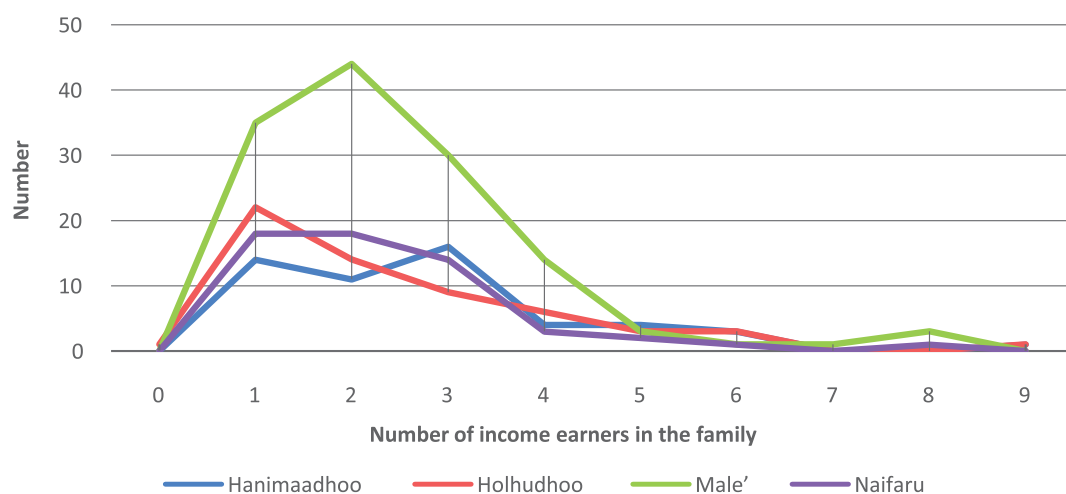
Level of income and expenditures of the study household

Figure 38: Income status over the last 10 years



The income status of the respondents in the study sites over the last ten years have been favourable. Over 36 per cent have said that it has increased and 25 per cent has stated that it has remained the same while 15 per cent of the respondents have stated that their incomes have decreased over the last ten years. Twenty-two per cent did not respond to the question. This increase is in line with the data provided by the household and income and expenditure survey (HIES) undertaken by the National Bureau of Statistics in 2009 which estimates that the total monthly household income has almost doubled between 2002/2003 and in 2009/2010 for the whole Republic and for the Atolls and Male' separately. One of the contributing factors might be the increase in the salaries of the civil service in 2009, as reiterated in the HIES (Government of Maldives, National Bureau of Statistics, 2009).

From the mixed focus group discussions in Naifaru, respondents have stated that fishing is the main source of livelihood, however more opportunities have arisen in the past 10 years and people have gone into the tourism sector and there are now other income generating activities undertaken by women who stay at home. In Holhudhoo the mixed focus group respondents stated that a significant number of people believe that the large number of new resorts has opened up a vast job market for the people of Holhudhoo. In Hanimaadhoo, the focus group participants stated that the average income of the residents of the island has increased greatly with more businesses opening and the job market expanding. Hence more people migrate to Hanimaadhoo to become employed, and as a result the island is very financially stable. Therefore in all the three sites, plus Male', more job opportunities have been created due to new resorts opening and women who stay at home have opened up their own small businesses.

Figure 39: Number of income earners in the family

The majority of the households i.e. 55 per cent have 1 to 2 income earners. Twenty-one per cent of the households had 3 income earners, while 8 per cent had 4 income-earning members and 3 per cent had 5 income earners from the total households surveyed. A minimal percentage of households had more than 5 income earners in the surveyed households. The number of income earners did not have any relation with the household size or the gender, but rather was dependent on the availability of jobs in the study area. This is clearly evident in the Naifaru, Hanimaadhoo and Male' sites.

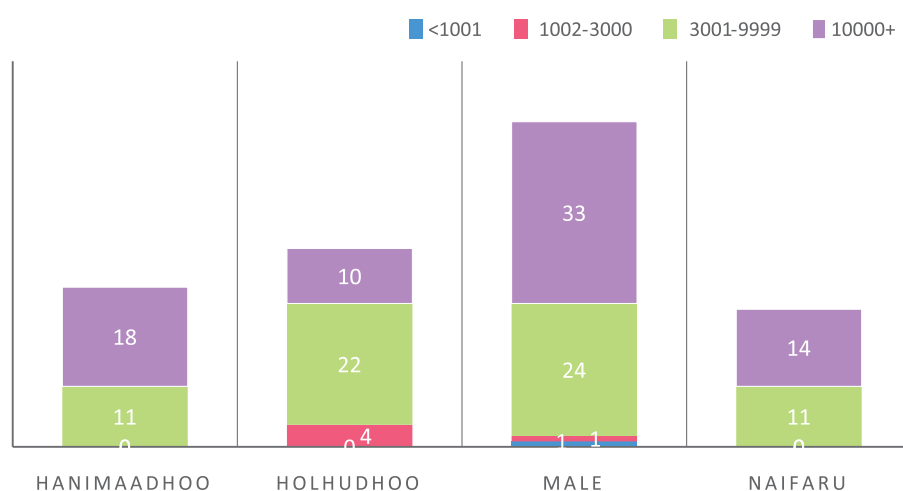
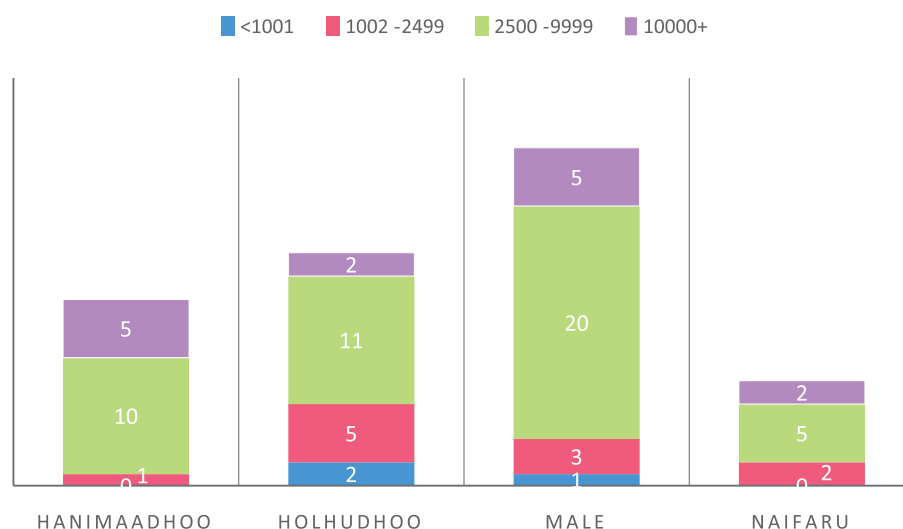
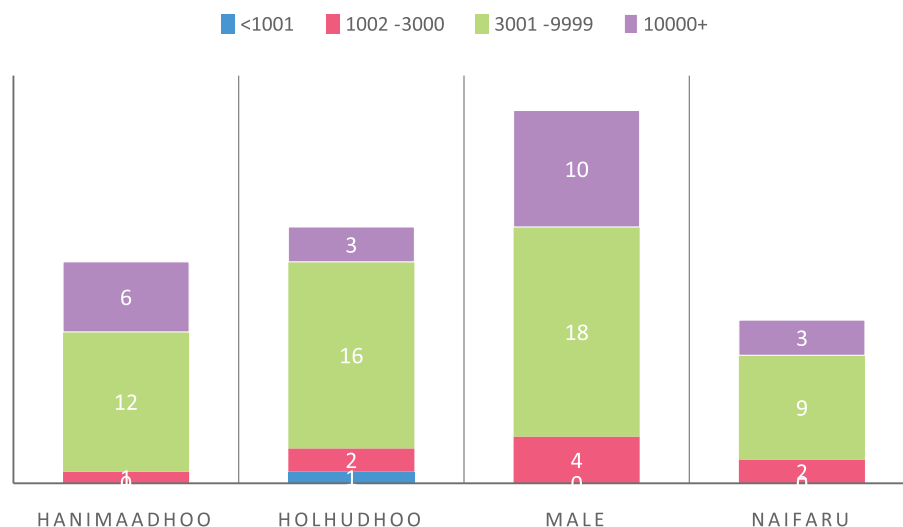
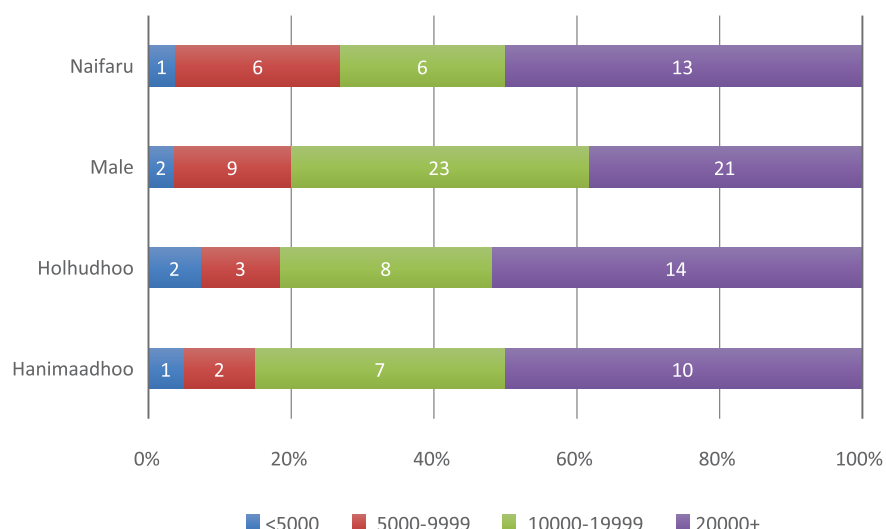
Figure 40: Household monthly income, in Maldivian Rufiya

Figure 41: Household monthly income 10 years ago (in MVR)**Figure 42: Household monthly income 5 years before (in MVR)**

Hanimadhoo shows a marked improvement in the income earned compared to 10 years ago. 10 years ago, 8 per cent of the households in Hanimaadhoo had a monthly income of 10,000 Maldivian Rufiyaa or more. Five years ago, the figure had increased to 10 per cent of the households. Currently, 30 per cent of the surveyed households earned more than 10,000 Rufiyaa. However, it should be noted that this increase should be viewed with caution as most households did not respond to the question. In Naifaru, Holhudhoo and Male' the same trend was seen, but to a lesser extent than in Hanimaadhoo. As stated in the key informant interviews, this might be due to the new job opportunities made available in Hanimaadhoo for its resident population. In Male', 58 per cent of the respondents were students or unemployed with no income.

Figure 43: Household monthly income range, in Maldivian Rufiyaa

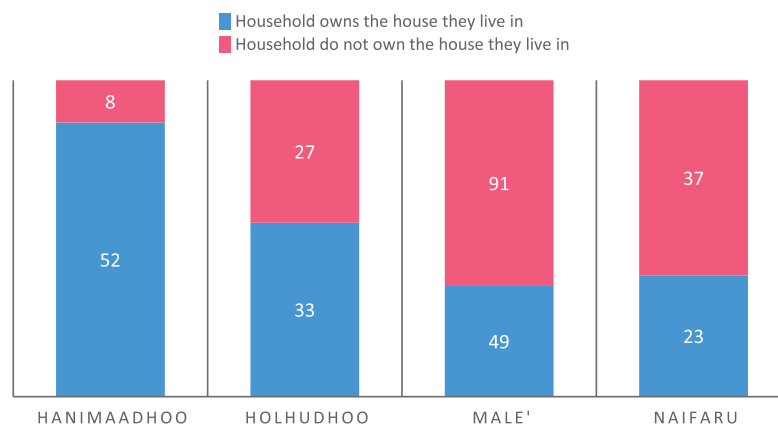
Twenty per cent of the household's monthly income across all study locations falls within the bracket of 5,000 to 19,999 Maldivian Rufiyaa per month. Eighteen per cent falls within the income bracket of above 20,000 Rufiyaa per month from the total surveyed households. As noted above, respondents were not forthcoming with information on income, as 60 per cent did not respond to the question.

In terms of expenditure, 20 per cent of the households stated that they spend 3,001 to 9,999 Maldivian Rufiyaa per month on their daily household needs. None of the respondents stated how much they spend on housing and construction expenses. Regarding loan repayments, 66 per cent did not answer the question, which may mean that the surveyed households do not have the relevant information regarding how much they spend in total on their daily needs, or do not wish to share this information. However, had the questionnaire been phrased in such a way as to ask the respondents about the details of what they spend on a daily basis, the responses might have been more informative.

The HIES undertaken in 2012 from the National Bureau of Statistics shows that there are differences in the spending patterns on the expenditure groups between Male' and the atolls. The household expenditure on food accounted for 25 per cent while in Male' it was 17 per cent. In Male', 33 per cent of household expenditure was on housing while in the atolls it was less than half of that. Nevertheless, food and housing represent the largest share of household expenditure in both Male' and the atolls (Government of Maldives, National Bureau of Statistics, 2009).

Property Ownership

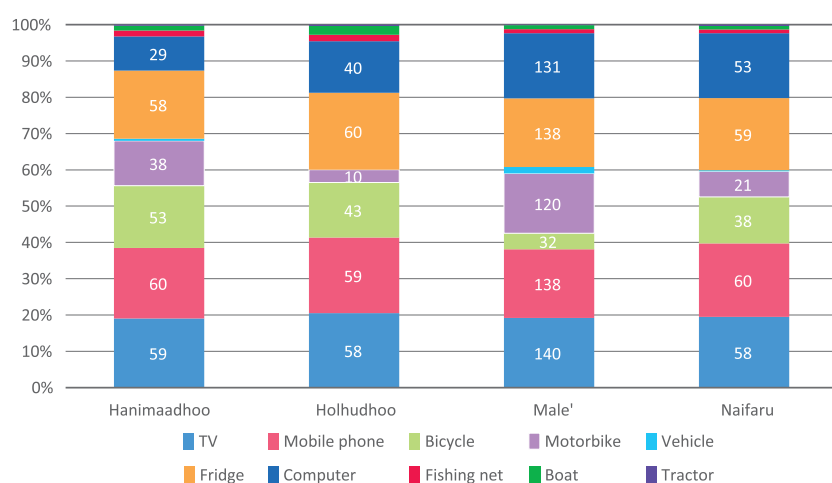
Figure 44: Household ownership



According to the Land Act of the Maldives, the Government allocates land for the construction of households and buildings for residential purposes to Maldivians free of charge. Issuing of land will follow the regulations published publicly by the respective government authorities. The Figure above shows that in Male', 49 respondents owned the houses they live in, and 91 respondents do not own the house or live in rented apartments. Since 140 households out of the 320 interviewed for this study live in Male' and the greater Male' area, it is not surprising that nearly half of the households in this study live in rented houses. Most of them are likely to be migrants from other islands who have moved to Male' (the capital city).

Household Assets

Figure 45: Household assets



Ninety eight per cent of the households own a television and a fridge and 99 per cent of households own a mobile phone. Ninety-three per cent of households in Male' own a computer however the other three sites only 67 per cent of households own a computer. The same applies for motorcycles where 85 per cent of the households in Male' own a

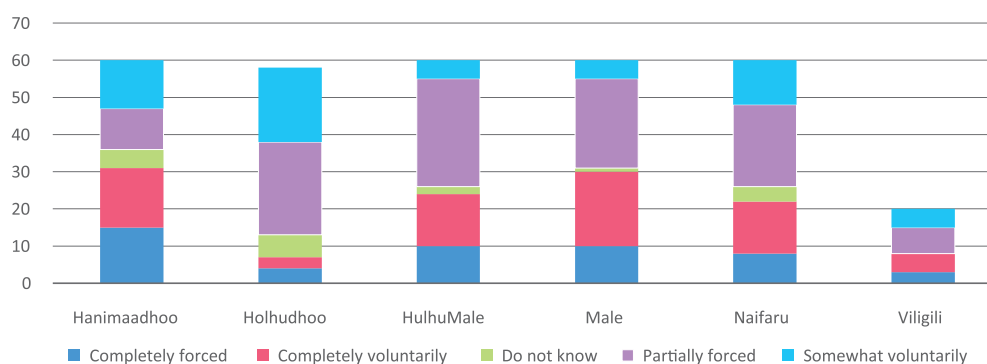
motorcycle while 38 per cent of households in the other three sites own a motorcycle. With regard to other assets like fishing nets, boats and tractors only a very minimal percentage of households own these assets. The ownership of assets like television, fridge and computers are the same across the country and not restricted to the studied sites only.

6.6.3 State of migration in the study areas

Although the 2014 census reports that around 5,000 Maldivians live abroad, no further information is available on the Maldivian population that has migrated. However internal migration from one island to the other and from smaller islands to bigger islands and cities is captured in the official census data.

Why do people migrate within the country?

Figure 46: Internal migration



The chart above shows that the majority of the respondents (37%) perceive migration as partially forced and 15 per cent of the respondents perceive it as completely forced. On the other hand, 22 per cent state that migration is completely voluntary followed by 18 per cent of the respondents stating that migration is somewhat voluntary. The 30 migrant households interviewed in Male' are internal migrants from the outer islands.

Many of the respondents from Hanimaadhoo are migrants who were forced to leave their island because of tidal waves from Hathifushi. The Hathifushi community had to move in 2007 to Hanimaadhoo because the tidal waves came into the island and flooded the whole island. The government evacuated the community members and brought them to Hanimaadhoo. The community members stayed in different households with the Hanimaadhoo community until housing was provided to all the members.

In the key informant interviews and FGDs, the reasons provided by the respondents for internal migration are mainly for education, jobs and health and climate related factors.

Migration due to non-climatic factors

Access to education and services were important non-climatic factors as described by the respondents:

- Some people migrate after the children complete year 10 and move to cities for higher education;
- For example, some people from Holhudhoo did not migrate because of the tidal waves or flooding, they migrated for educational purposes;

- People migrate to Male' for education, evidenced by school enrolment figures each year in Male';
- Some islands do not receive basic services because the population size is small, so it is an advantage for people living in smaller communities to migrate to bigger cities and islands under the population consolidation programme.

People also tend to migrate because of marriage to a person from another island.

The FGDs revealed that people who migrated from the small islands to Hanimaadhoo believe that Hanimaadhoo is a safe island. However, it does not meet the standard of a "safe island" according to the Government concept, although many opportunities exist on this island.

Future migration scenarios

The respondents identified climatic and other environmental factors as influencing migration scenarios. The key points expressed in the FGDs were:

- People will migrate in the future if their livelihoods are affected by climate change induced hazards;
- Some of the ground water is so polluted that people do not use their own wells, some households use water from another household and migration may be indirectly related to these factors;
- Due to tidal waves people living near the beach have to move inland during the easterly monsoon in Holhudhoo and some families migrated to Male';
- The people who live in Hanimaadhoo, such as the Hathifushi community, have migrated because of tidal waves.

Reluctance to migrate as perceived by respondents:

- Even though the government encouraged the community of Naifaru to migrate to Maafilaafushi, the community did not migrate because facilities like housing were not available;
- The smaller and more vulnerable communities like Ohuvelifushi (small community near Naifaru) in LH atoll need to migrate, but this community does not want to move because they are happy to live on their own island where they have created their own identity.

Planned relocation

- After the Tsunami people migrated or were relocated to other islands, such as Dhuvaafaru.

Based on the responses from the FGDs, the key informant interviews and the household surveys that internal migration is mainly due to non-climatic factors such as education, health and job opportunities and people tend to move to developed islands or regions. The National Bureau of Statistics has undertaken a study on migration patterns for the whole of the Maldives and the main reason given in this report is also education as the number one factor among boys and girls in the age groups 15–19 years and 20–24 years. The second reason cited for migration by the residents of Male' is to look for employment. It was stated in a new report by the United Nations Population Fund (UNFPA) that 30 per cent of people among this group declare that they are not attending any school program (May 2016).

The policy of the government drives the migration and this is reflected in the changing policies from the governments in power. However it is worth noting that some of the key informant interviews have highlighted that environmental factors will be considered in the future when people consider migration as an adaptation option for climate change-induced hazards.

As one of the policymakers interviewed explained, “The trend in the movement of people has not changed within the past 25 years. People want to move from smaller islands either voluntarily or by lack of choice. Choice of destination depends on the facilities and incentives provided by the government. The community of H.DH.Hodaidhoo moved to Hanimaadhoo, which the government was promoting as a growth centre. Some people move to cities for the facilities and services provided at their own will. In the future climate change induced displacement will become more prevalent once the communities start facing these hazards more frequently.”

Boarding facilities for outside students who have migrated to this island of Naifaru to study in the school have been established and the families of the students are allowed to stay in the boarding facility. Villa college campus will be opened next year and students do not have to migrate from the island for higher education. Every year some families move out of the island mostly to Male’ for better education and health facilities. Sometimes families move out for higher education or university education because people do not trust their children to live with foster families.

Why do people migrate outside the country?

Figure 47: International migration

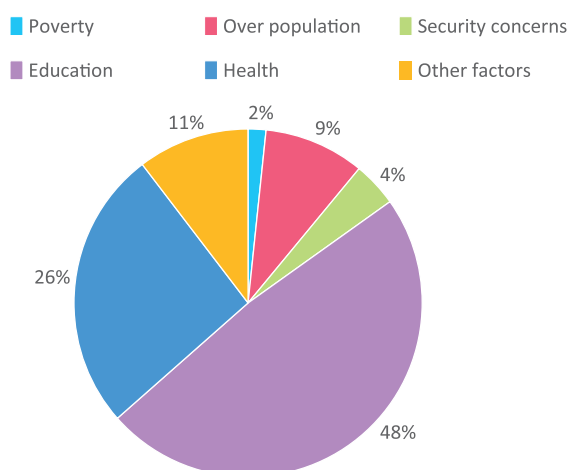
Factors	Total	Island					
		Hanimaadhoo	Holhudhoo	HulhuMale	Male	Naifaru	Viligili
Completely forced	72	29	16	8	4	13	2
Completely voluntarily	97	15	4	21	38	14	5
Do not know	24	4	7	4	2	6	1
Partially forced	69	6	12	15	6	22	8
Somewhat voluntarily	55	5	20	12	10	4	4
(blank)	3	1	1			1	
Grand Total	320	60	60	60	60	60	20

Thirty per cent of the household respondents stated that people migrate to other countries completely voluntarily. Seventeen per cent of the household respondents stated that people migrate abroad because they are partially forced. Twenty-two per cent stated that people migrate abroad because they are completely forced. Some families indicated that they have moved because the necessary health and education facilities are not available from the Maldives. People have migrated outside the country to Sri Lanka and India for reasons related to basic needs, which are not accessible, such as the provision of clean water for drinking and other basic services.

A member of the Department of Immigration summed up some of the key reasons: “People move to international destinations because living in Male’ is more expensive than living in Sri Lanka or India. Some people have migrated outside of the country to Sri Lanka and India for reasons such as getting quality health and education facilities.”

6.6.4 Non-climatic factors affecting migration in the study areas

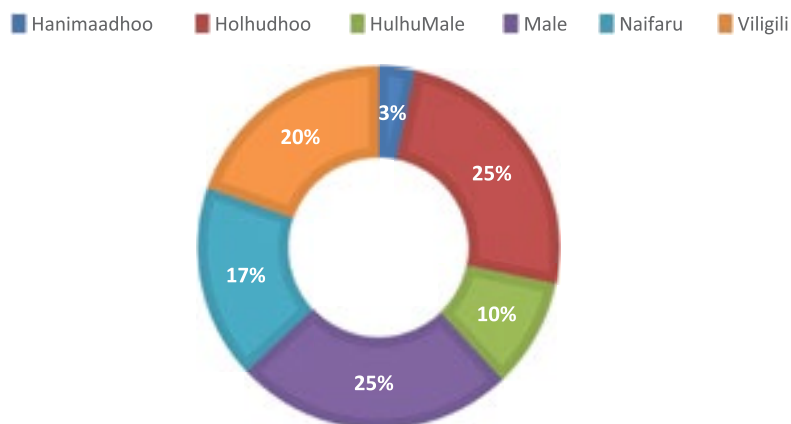
Figure 48: Non-Climatic factors that influence migration



Education is the number one factor identified by the respondents contributing to 73 per cent of the households. Health is the number two factor at 40 per cent followed by other factors and over population (16 and 14 % respectively).

The main reasons for migration from Hanimadhoo have been elucidated by respondents during the FGDs. It was noted that “There is a significant increase in migration from other islands to Hanimadhoo and it is bound to increase more within the next 8–10 years. The youth and middle-aged people prefer to migrate anywhere, more than the elderly. Better job opportunities, marriages and other factors include reasons for the increase in migration to the island. Some people are forced to migrate from island to island to search for job opportunities as they are not available in some islands, making the people of Hanimaadhoo extremely lucky.”

Figure 49: Non-climatic factors did not contribute to household decisions to migrate



Forty-two per cent of the respondents said that non-climatic factors identified have not influenced their family's decision to migrate. Twenty-five per cent have agreed that the non-climatic factors identified in the table have influenced their families and 32 per cent have not responded to this question. Figure 49 above sets out the proportions by location.

6.6.5 Migration trends from the study areas

The trends of migration from the study sites reveal that people migrate mainly for better education facilities and opportunities available in the larger islands and cities.

N. Holhudhoo: The population has grown because people have migrated from this island to Male' and vice versa. Families from Sh Fodhdhoo and Magoodhoo and also from Lhohi come to Holhudhoo for their children's education.

H. DH. Hanimaadhoo: In the case of Hanimaadhoo, the population has grown due to migration and migrants comprise of about 30 per cent of the population.

LH. Naifaru: Most of the people migrate from Naifaru to Male', Hulhumale' and Villingili for educational purposes. Each year an average of five families migrate away from Naifaru, but often return to the island.

Another factor that promotes migration away from Naifaru is marriage to people from other islands, which is indicated by the fact that 80 per cent of people working in Felivaru have migrated away from Naifaru to where their spouses live. In Naifaru, there are more opportunities in recent times compared to the past. Education and job opportunities are opening up more often, as new businesses, such as restaurants are being established. The hospital has increased its standards greatly, opening up more employment opportunities.

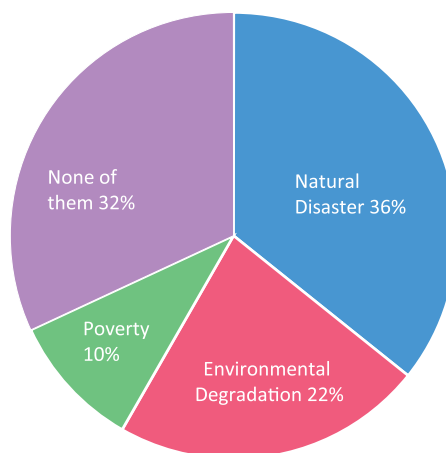
The migratory trends in the whole of the Maldives according to the migratory report published by the National Bureau of Statistics cites that migratory movements between atoll-islands outside Male' appear to have increased significantly between 2006 and 2014. Although the rates of net migration to Male' appear to be leveling off, the scale of migration and the number of migrants to Male' is on the increase. Out of the 338,434 resident Maldivians, 44 per cent of the population (147,927) had shifted their residence previously.

6.6.6 Type of migration from the study households

- 1) The types of migration that the respondents have identified mainly falls within six categories.
- 2) Persons working in the nearby resorts and other factories, such as Felivaru canning factory can travel home on a daily basis.
- 3) People who also work in other resorts far away come to the island on a regular basis once a week because transport is easy to and from islands such as, Naifaru.
- 4) People who work in Yellow Fin tuna industry come home "Kanneli dhoani" (bigger boats used for fishing) once in 2 weeks.
- 5) People who work in resorts far away will come only once a month or on an annual basis.
- 6) People who go to seek medical services will be back once they have fulfilled the requirements.
- 7) People who move away from the island on a permanent basis to seek education for the younger family members will return for the annual holidays.

6.6.7 Reasons of forced migration from the study areas

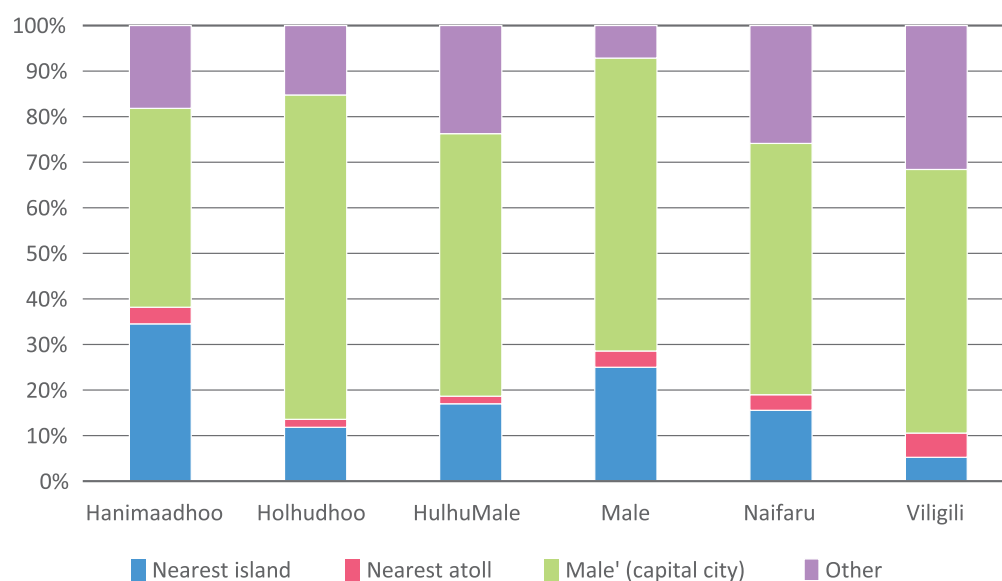
Figure 50: Reasons for forced migration



Natural disasters are the number one reason (36%) for forced migration followed by none of the categories outlined in the table. Environmental degradation comes third (22%). Only 10 per cent of the respondents identified poverty as a reason for forced migration.

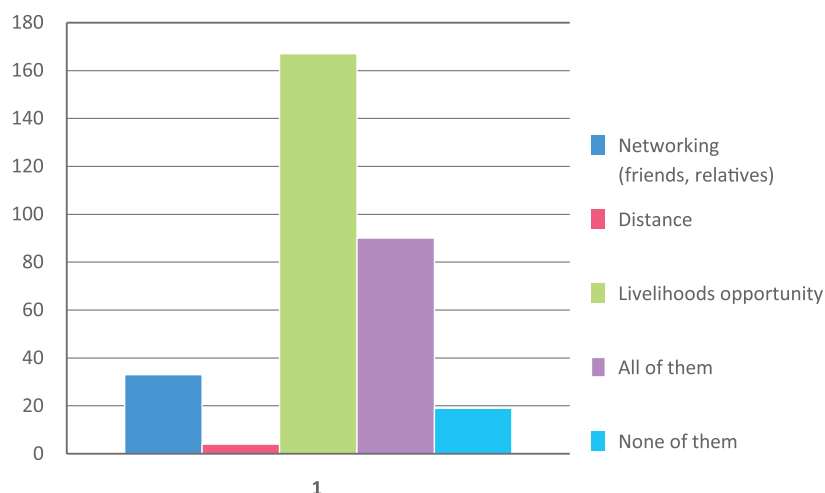
6.6.8 Preferred destinations

Figure 51: Preferred destinations



6.6.9 Factors influencing destination for internal migrants from the study areas?

Figure 52: Drivers influencing destination



As depicted in Figures 51 and 52 above, the preferred destination for migration is the capital city Male' (55%) followed by the nearest island (18%) and other (18%). The factors influencing choice of destination primarily relate to the livelihood options available for migrants (52% of households). Other important factors include networking with friends and relatives.

6.6.10 Remittances from migrants in the study areas

Figure 53: Do you receive remittances?

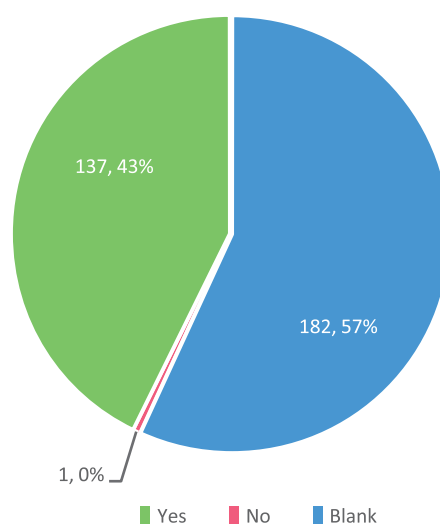
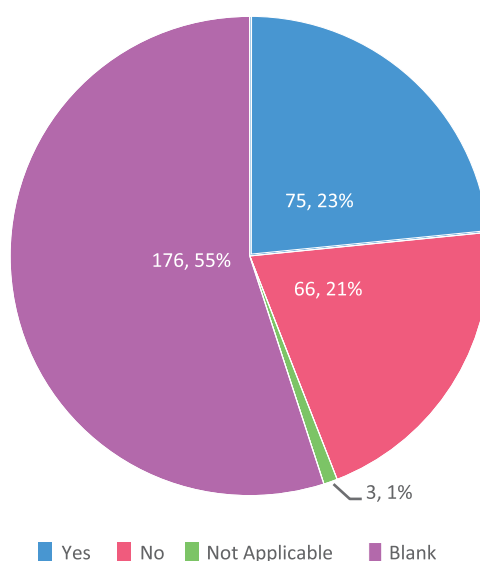
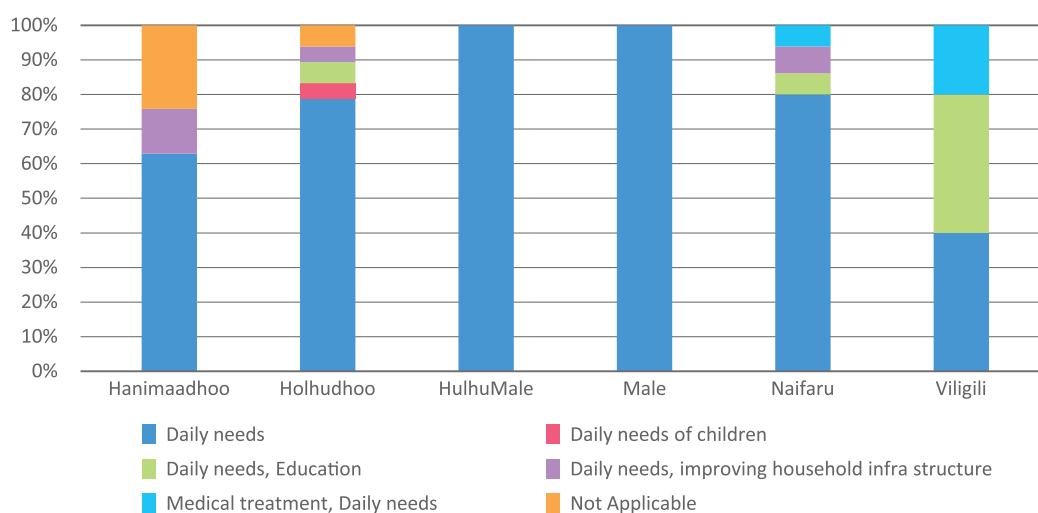


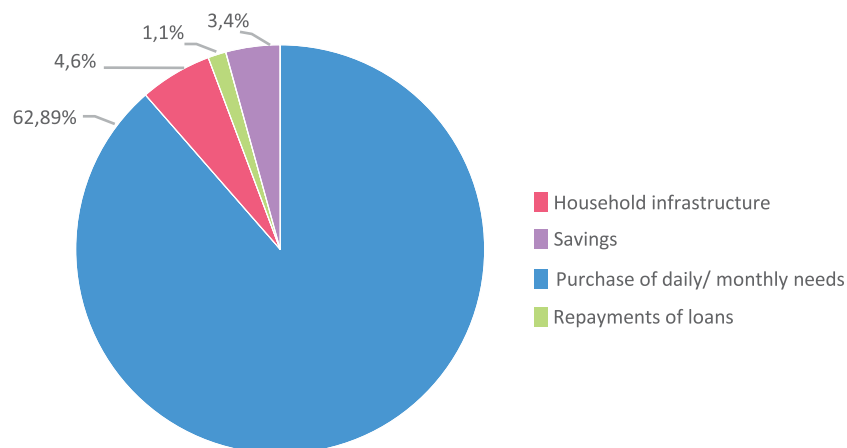
Figure 54: Remittances received regularly

From Figures 53 and 54 above it can be seen that 57 per cent of respondents receive remittances from a family member working away from home. These respondents belong to the migrant households. Out of this, 23 per cent receive remittances regularly and 21 per cent of households do not receive remittances regularly. People who receive remittances regularly can fulfill their daily needs and in addition could use remittances to support adaptation measures, to improve infrastructure and community/households resilience to disasters.

Figure 55: Ways of spending the remittances

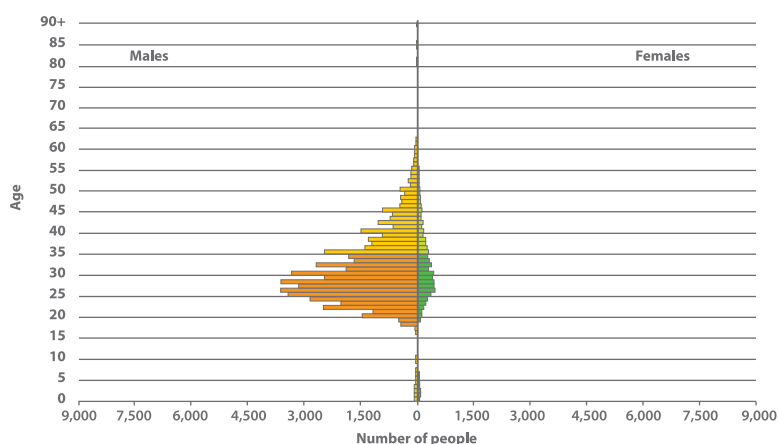
Note: Excluding non-response/ blank.

Figure 55 above shows that only 17 per cent of the households state that they use remittances for daily needs. While 78 per cent have not responded to this question, this might be because the respondents were not in a position to provide the answer since they may not be managing the household expenses.

Figure 56: Ways of spending the last remittances

Out of the household receiving remittances, 19 per cent of the households have spent MVR 3,800, 17,500 and 50,000 on their daily needs from the last amount remitted. Four households have spent MVR 10,000 on household infrastructure and only three households have saved MVR 2,500. Figure 56 above shows that for the most part households are not able to save the remittances received, except for three households in two sites.

6.6.11 The growing immigrant population

Figure 57: Number of immigrants in the Maldives

Source: May, 2016

The immigrant population accounts for 16 per cent of the total resident population in Maldives. The gender composition of the immigrant population includes a majority of men: almost 88 per cent of these residents are men. The foreign population is scattered all over the country and are present in the study sites especially the Male' and the greater Male' areas where the concentration of these residents is the highest. Among the immigrant population the largest number of immigrants are from Bangladesh, followed by Indians and Sri Lankans. Only 9 per cent of the immigrant population have lived in the Maldives for more than ten years. The figure for the number of immigrants varies according to unofficial estimates, and is believed to be higher than official numbers.

6.6.12 Climate change, environmental degradation and associated impacts on life and livelihoods in the study areas

Table 22: Impact of climate change and environmental hazards on households in Hanimadhoo as perceived by the households

Climate change and environmental hazard	Impact on the household			Impact change over the past 10-15 years			
	Yes	No	Not Stated	Increase	Decrease	Same	Not Stated
Hdh. Hanimaadhoo							
Temperate rise	34.17	15.83	0.00	27.50	2.50	4.17	15.83
Excessive rainfall	11.67	37.50	0.83	6.67	2.50	3.33	37.50
Lack of rainfall	27.50	22.50	0.00	15.83	5.00	5.00	24.17
Shifting of rainfall	19.17	30.83	0.00	15.00	1.67	1.67	31.67
Riverine flood	0.00	44.17	5.83	0.83	0.00	0.00	49.17
Flash flood	17.50	32.50	0.00	13.33	1.67	1.67	33.33
Fresh water scarcity	4.17	45.83	0.00	4.17	0.00	0.00	45.83
Salinity intrusion in water	3.33	46.67	0.00	2.50	0.00	0.00	47.50
Salinity intrusion in soil	9.17	40.83	0.00	8.33	0.00	0.83	40.83
Sea-level rise	4.17	45.00	0.83	2.50	0.83	0.83	45.83
Drought	3.33	46.67	0.00	2.50	0.83	0.00	46.67
Beach erosion	16.67	33.33	0.00	16.67	0.00	0.00	33.33
Storm surges	20.00	30.00	0.00	15.00	2.50	1.67	30.83
Cyclones/tidal waves	10.83	39.17	0.00	9.17	0.83	0.83	39.17
Landslide	7.50	42.50	0.00	6.67	0.00	0.83	42.50
Water logging	8.33	41.67	0.00	8.33	0.00	0.00	41.67
Earthquake	0.83	49.17	0.00	0.83	0.83	0.00	48.33
Water pollution	6.67	43.33	0.00	6.67	0.00	0.00	43.33
Ground water declining	1.67	48.33	0.00	0.83	0.83	0.00	48.33
Arsenic (a chemical compound) contamination	0.00	0.00	50.00	0.00	0.00	0.00	50.00
Heat wave	1.67	48.33	0.00	1.67	0.00	0.00	48.33
Cold wave	33.33	16.67	0.00	28.33	1.67	3.33	16.67
Others	8.33	40.83	0.83	1.67	2.50	4.17	41.67

Note: Data from household survey

The household survey provided insights into how climate change was affecting the lives of the respondents. In Hanimadhoo, the respondents identified rises in temperatures as one of the factors which has affected daily life. In addition, the island is faced with soil erosion from the beaches. This is easily observed as a significant land area of around 50 feet is lost due to soil erosion, and now some houses are at the brink of being lost and washed away. Soil erosion has been occurring at a faster rate than when the harbour was first constructed. The beach

has completely eroded away and erosion is only occurring from one side of the island. Due to soil erosion, not enough of the sand is left in the beaches for people to take and use to make houses. The respondents in the mixed FGDs do not believe that taking sand from the beach is an issue and in any way linked to beach erosion. The roads of Hanimadhoo face very heavy flooding due to heavy rain and poor irrigation. Iruvai monsoon is now longer and hotter than before with Hulhangu monsoon having less rainfall. Iruvai monsoon often leads to a shortage of water and the Government took a very long time to address the issue. Water shortage affected the teachers more than the students (this was observed by a school principal) as they barely have free time in between teaching hours to search for water. Water was brought in from Kulhudhufushi to be used at the household level.

Table 23: Impact of climate change and environmental hazards on households in N. Holhudhoo as perceived by the households

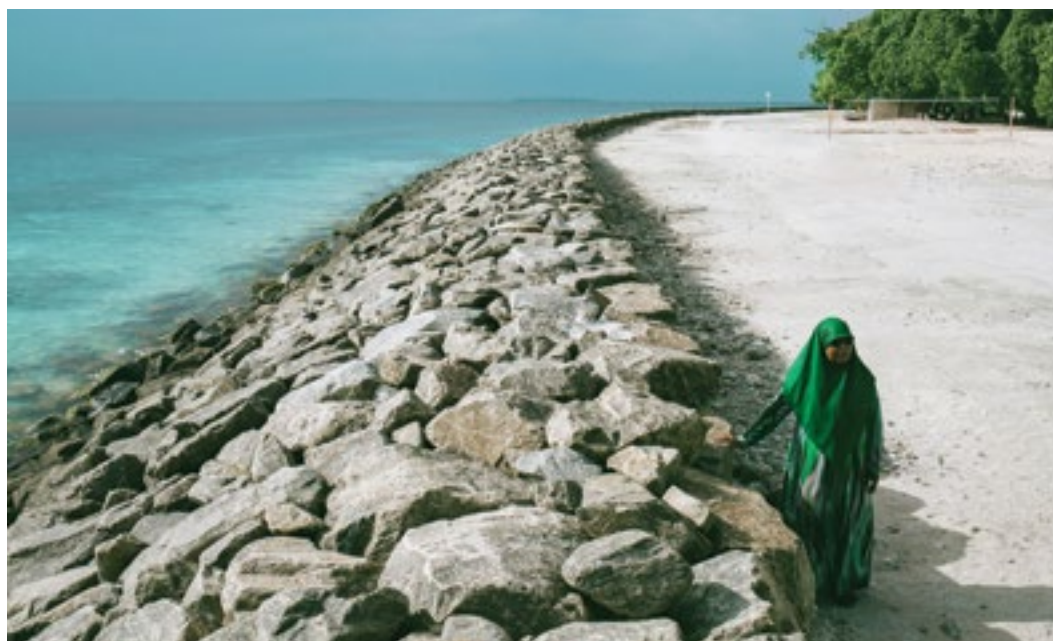
Climate change and environment hazard	Impact on the household			Impact change over the past 10-15 years			
	Yes	No	Not Stated	Increase	Decrease	Same	Not Stated
N. Holhudhoo							
Temperate rise	40.00	10.00	0.00	36.67	0.00	3.33	10.00
Excessive rainfall	16.67	32.50	0.83	10.00	5.00	1.67	33.33
Lack of rainfall	30.83	19.17	0.00	23.33	3.33	3.33	20.00
Shifting of rainfall	24.17	25.00	0.83	17.50	2.50	3.33	26.67
Riverine flood	15.00	28.33	6.67	10.83	1.67	1.67	35.83
Flash flood	26.67	23.33	0.00	20.00	4.17	1.67	24.17
Fresh water scarcity	1.67	48.33	0.00	1.67	0.83	0.00	47.50
Salinity intrusion in water	22.50	27.50	0.00	20.83	0.00	1.67	27.50
Salinity intrusion in soil	27.50	22.50	0.00	20.00	2.50	3.33	24.17
Sea-level rise	24.17	25.83	0.00	17.50	3.33	2.50	26.67
Drought	18.33	31.67	0.00	17.50	0.00	0.83	31.67
Beach erosion	31.67	18.33	0.00	30.83	0.00	0.00	19.17
Storm surges	33.33	16.67	0.00	29.17	1.67	1.67	17.50
Cyclones/ tidal waves	28.33	21.67	0.00	25.83	0.83	0.83	22.50
Landslide	17.50	32.50	0.00	17.50	0.00	0.00	32.50
Water logging	19.17	30.83	0.00	17.50	1.67	0.00	30.83
Earthquake	0.83	49.17	0.00	0.83	0.00	0.00	49.17
Water pollution	30.00	20.00	0.00	27.50	1.67	0.83	20.00
Ground water declining	16.67	33.33	0.00	13.33	0.83	0.83	35.00
Arsenic (a chemical compound) contamination	0.00	0.00	50.00	0.00	0.00	0.00	50.00
Heat wave	3.33	46.67	0.00	0.83	0.00	2.50	46.67
Cold wave	47.50	2.50	0.00	43.33	0.83	3.33	2.50
Others	6.67	43.33	0.00	3.33	0.83	2.50	43.33

Note: Data from household survey.

Flooding of the roads during the rainy season is one of the biggest issues faced by the residents of Holdhudoo. Even if it rains non-stop for an hour, all the roads become flooded with water and the island council must start work to drain the water using water pumps. Therefore, it is very difficult for the women to take their children to school and there is no way to do that without getting soaked in the “river” of water. In addition to this, during the rainy season, tidal waves often crash into the island and flood the roads more. One family decided to migrate to Male’ as the waves affected their household located near the beachfront.

The salinity and impurity of the groundwater has increased significantly. The water extracted from wells has a foul odour and is polluted, evident by its milky colour. As a result many households are unable to use well water and are forced to use rainwater for all purposes, though rainwater is often used only for drinking and well water is used for bathing, washing and other purposes.

With many people so reliant on rainwater, the island experiences water shortages during the hot season due to the lack of rainfall. The tanks found in households run out of rainwater and people are forced to share water from other houses with an excess supply or ask the government for aid. There are some cases where houses with a viable well, supply well water to those in need through a series of pipes. A proper sewage and water supply system is currently being established in the island to overcome these issues.



Seawall in Holdhudoo, Maldives.

Vehicles, washing machines, and other household items plus all metal objects found in or near households located on the beachfront undergo rusting due to the waves that crash over the sea wall. As a result, many household gadgets rust easily and the expenditure of residents increases.

Table 24: Impact of climate change and environmental hazards on households in Male' as perceived by the households

Climate change and environment hazard	Impact on the household			Impact change over the past 10-15 years			
	Yes	No	Not Stated	Increase	Decrease	Same	Not Stated
Male'							
Temperate rise	91.67	25.00	0.00	84.17	1.67	5.83	25.00
Excessive rainfall	55.00	61.67	0.00	47.50	2.50	4.17	62.50
Lack of rainfall	23.33	93.33	0.00	17.50	3.33	1.67	94.17
Shifting of rainfall	36.67	79.17	0.83	32.50	3.33	0.83	80.00
Riverine flood	13.33	93.33	10.00	12.50	0.83	0.83	102.50
Flash flood	27.50	87.50	1.67	23.33	0.83	3.33	89.17
Fresh water scarcity	7.50	107.50	1.67	8.33	2.50	0.00	105.83
Salinity intrusion in water	32.50	84.17	0.00	30.00	0.83	2.50	83.33
Salinity intrusion in soil	61.67	55.00	0.00	54.17	3.33	2.50	56.67
Sea-level rise	56.67	60.00	0.00	51.67	1.67	1.67	61.67
Drought	37.50	79.17	0.00	35.83	0.00	0.00	80.83
Beach erosion	64.17	52.50	0.00	61.67	0.00	0.83	54.17
Storm surges	39.17	77.50	0.00	35.83	1.67	0.00	79.17
Cyclones/tidal waves	39.17	77.50	0.00	38.33	0.00	0.00	78.33
Landslide	25.00	91.67	0.00	25.00	0.00	0.00	91.67
Water logging	24.17	92.50	0.00	24.17	0.00	0.00	92.50
Earthquake	7.50	109.17	0.00	7.50	0.83	0.83	107.50
Water pollution	39.17	76.67	0.83	36.67	1.67	0.83	77.50
Ground water declining	26.67	90.00	0.00	16.67	0.83	0.00	99.17
Arsenic (a chemical compound) contamination	0.00	0.00	116.67	0.00	0.00	0.00	50.00
Heat wave	9.17	107.50	0.00	10.00	0.00	0.00	106.67
Cold wave	80.00	36.67	0.00	76.67	0.83	1.67	37.50
Others	3.33	103.33	10.00	1.67	0.00	0.00	115.00

Note: Data from household survey.

The heat has become unbearable in the capital city with the shifting patterns in the weather so that the residents have to use air-conditioning and it has become a necessity rather than a luxury for the city dwellers. People are using energy saving lights, fans and air-conditioners in order to bring the cost of living to a manageable level. In Male', all households are supplied with desalinated water, the pressure of the water supplied to the households is also controlled to avoid wasting of piped water, which is used in the households. Male' has a population density of 58,500 persons per km². Male' has 14,107 households with an average household size of 7.4 persons. The overcrowding of population leads to greater risk of infections from communicable diseases. Air pollution

is an emerging issue in Maldives and is confined largely to Male'. Male' has also been experiencing tidal waves during the South Westerly monsoon on a continuous basis.

In Male' and the greater Male' area which is the capital city of the Maldives and there are more job opportunities as well as other facilities and the preferred destination for the respondents from all the study sites. However the respondents in the mixed focus groups have also identified that the city is very densely populated.

Table 25: Impact of climate change and environmental hazards on households in Lh. Naifaru as perceived by the households

Climate change and environment hazard	Impact on the household			Impact change over the past 10-15 years			
	Yes	No	Not Stated	Increase	Decrease	Same	Not Stated
Lh. Naifaru							
Temperate rise	40.83	9.17	0.00	34.17	2.50	4.17	9.17
Excessive rainfall	20.83	29.17	0.00	18.33	1.67	0.83	29.17
Lack of rainfall	22.50	27.50	0.00	17.50	0.83	4.17	27.50
Shifting of rainfall	18.33	30.83	0.83	15.00	0.00	3.33	31.67
Riverine flood	10.83	27.50	11.67	10.83	0.00	0.00	39.17
Flash flood	21.67	28.33	0.00	20.83	0.83	0.00	28.33
Fresh water scarcity	7.50	42.50	0.00	8.33	0.83	0.00	40.83
Salinity intrusion in water	15.00	35.00	0.00	15.83	0.83	0.00	33.33
Salinity intrusion in soil	26.67	23.33	0.00	25.00	0.83	0.83	23.33
Sea-level rise	30.83	18.33	0.83	28.33	2.50	0.83	18.33
Drought	14.17	35.83	0.00	13.33	0.83	0.00	35.83
Beach erosion	15.00	35.00	0.00	14.17	0.00	0.83	35.00
Storm surges	32.50	17.50	0.00	28.33	0.83	3.33	17.50
Cyclones/tidal waves	15.00	35.00	0.00	13.33	0.00	0.00	36.67
Landslide	13.33	36.67	0.00	14.17	0.00	0.00	35.83
Water logging	16.67	33.33	0.00	16.67	0.00	0.00	33.33
Earthquake	2.50	47.50	0.00	2.50	0.83	0.00	46.67
Water pollution	23.33	26.67	0.00	23.33	0.00	0.00	26.67
Ground water declining	15.00	35.00	0.00	12.50	1.67	0.00	35.83
Arsenic (a chemical compound) contamination	0.00	0.00	50.00	0.00	0.00	0.00	50.00
Heat wave	1.67	47.50	0.83	2.50	0.00	0.00	47.50
Cold wave	35.83	13.33	0.83	35.00	0.00	0.83	14.17
Others	5.00	44.17	0.83	5.00	0.00	0.00	45.00

Note: Data from household survey.

The island of Naifaru has been extremely hot in recent times, compared to a few years ago, which results in more expenses such as investments in air conditioners and more fans. Furthermore the island has a very large population but very small space leading to the construction of very narrow roads and tiny houses for people to live in and lack of space to plant any trees. Houses in Naifaru are very low lying and thus heavy rains can flood the households whenever it rains. However, newly constructed houses are raised, to prevent this issue. Well water in 80 per cent of the island's area cannot be used due to its pungent smell and salinity. The main water well is located in the middle of the main road and connected to all the houses, while the other is located below an area which used to be a marshy garbage area. Hence pollutants drain into the well water causing the smell and bad taste.

Fishing is the main source of livelihood in Naifaru, however more opportunities have arisen in the past 10 years and people have gone into the tourism sector and women who stay at home undertake other income generating activities. The reasons have not been studied in depth to identify the factors why people choose other jobs. Most of the households have people who work in the civil service. Naifaru is a fishing island so many people earn their incomes through fishing. Women who stay in the households also earn an income by making short eats and by tailoring and making "roshi" (flat bread) and curry and selling it to other households. During monsoons, tidal waves or Udha affect the island. During the westerly monsoon the flooding of the island is observed. However the tidal waves do not affect the households now since the island has been reclaimed. In the dry season it is very hot and the heat is unbearable. During the Hulhaugu Monsoon, the flooding of this island has impacted the day-to-day activities of the communities and restricted the movements of the communities within the island due to flooding of the roads and to outbreaks of dengue, which is a result of mosquitoes breeding.



Flooding in Male' city.

6.6.13 Adaptation to climate change impacts

Study households taking adaptation actions

Many households (37%) have taken measures to adapt to the situations they are facing right now due to climate change. Some of the adaptation actions, as identified by the respondents, are listed below:

- 1) Due to excessive rainfall during the Hulhagu monsoon the roads of Holhudhoo get flooded. The community members have raised their houses because the floodwaters come into the house. Now community pumps are used to pump out the water from the roads when it is raining, especially in the lower area of the island. When the roads are flooded moving from one place to the other is a hassle.
- 2) The island of Meedhoo, located nearby Holhudhoo, has been given to Holhudhoo council and is now officially a property of Holhudhoo council. Though it is not inhabited, it is hoped (by the island community members) that it will be developed into a city and people of Holhudhoo and nearby islands can migrate there. However, most elderly people will probably not migrate to Meedhoo and try to stay, unlike the younger generations.
- 3) To prevent the flooding of houses in Holhudhoo when roads become flooded, new houses are constructed so that they are raised to prevent the entry of water into the house. As a contingency for water shortages, there are many water storage tanks available to the community in “water points” such as the mosque to provide people with water. However they have very small capacity. People store any possible rainwater during the rainy season and preserve it for use during droughts as backup.
- 4) People refrain from using salt water to spray water for plants or to wash things now because the salt water results in rusting of metals and vehicles upon contact. People use rain water for these purposes.

- 5) In Naifaru, people share water with their neighbours when they are faced with water scarcity while some people buy supply water from water points distributed across the island or purchase bottled mineral water from the shops when they run out of rain water. All new houses have underground tanks to store rainwater and thus few houses run out of water during drought. In recent droughts, many people shower with salt water without any complaints since they are used to it. Despite all this, the island has never reached a critical situation where the island had to import water from Male' or another island due to water shortage.
- 6) Houses in Naifaru are very low lying and thus water can get into the house whenever it rains. However, newly constructed houses are raised, in order to prevent the water entering the households.
- 7) On the island of Holhudhoo, the island council has carried out a successful project to build a seawall with rocks around the island. Although waves still crash over the wall and flood roads, the adverse effects have been minimized.
- 8) The households of Holhudhoo have started to use large underground water storage tanks that store rainwater used for showering, washing and other purposes. Also, overhead tanks are established to store rainwater for drinking.

6.6.14 Types of adaptation strategies taken by the study households

- Due to tidal waves, people living near the beach have to move inland during the easterly monsoon in Holhudhoo and some families migrated to Male'.
- The people, who live in Hanimaadhoo, such as the Hathifushi community, have migrated because of tidal waves.
- Internal remittances sent by household members who have migrated abroad are used for daily consumption and the households who save then invest in water tanks.

In all the study sites at the household level the communities have initiated container gardening in any available space as an adaptation measure to the ground water salinization. According to the farmers in these island communities, when containers are used more than the surface ground, less water and less fertilizers need to be used, as these containers are water efficient. The communities surveyed had fewer people before and did not encounter the problem of ground water salinization. However, since the population has increased the competition for ground water resources has increased, which is used for agriculture as well as household use.

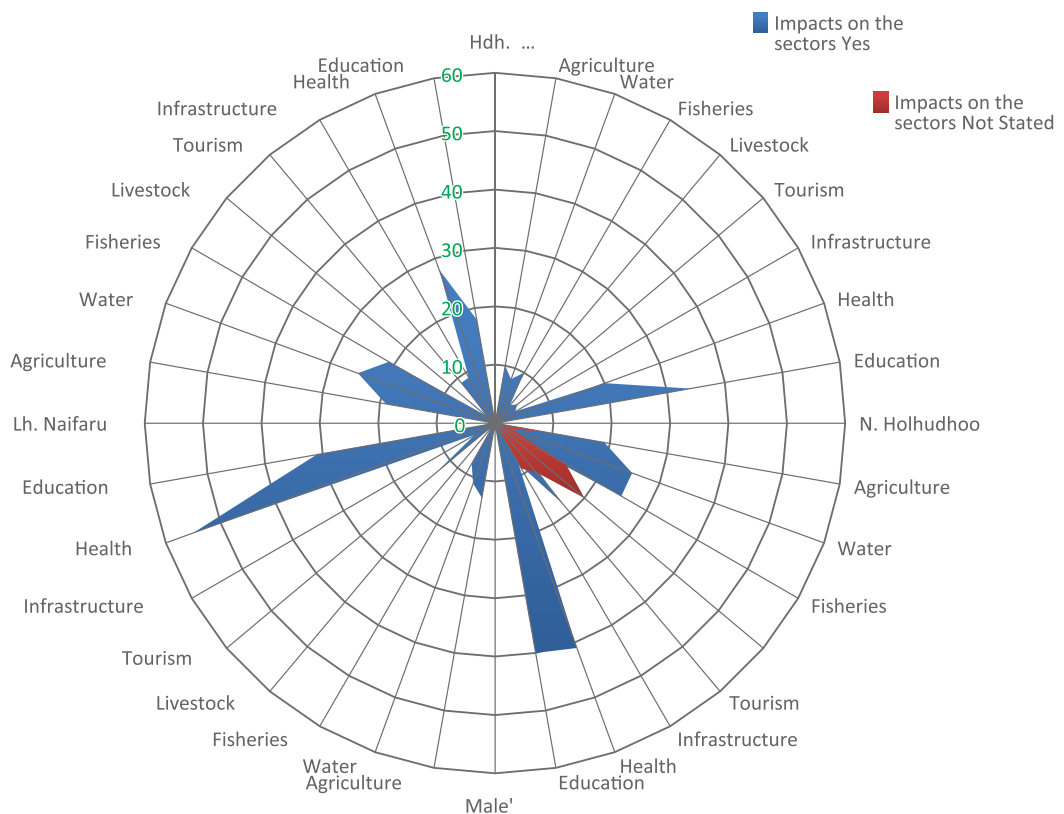
A storm drain has been designed by the community of Naifaru to catch the excess rainwater from the roofs of the households and replenish the ground water table. In Naifaru, the households have improvised little pits to catch the storm water and sink it to the ground. The respondents have stated that storm drains are often unable to manage the quantity of rain that falls during heavy rains and/or storms. When these improvised drains are inundated the streets get flooded. When the streets are flooded it is very difficult to move from one place to the other because the roads are not paved and a proper drainage system is not in place.

6.6.15 Migration, environmental degradation and climate change nexus

From the above information it can be derived that the respondents in this study agree that climate change will impact livelihoods, such as fisheries and tourism, as well as education and health, which will restrict the day to day activities of the communities. However none of the respondents linked these factors to migration.

In the key informant interviews, 27 respondents answered this question (question number 2) relating to environmental degradation factors and migration. Respondents can be categorized into three types. The most frequently cited response was coastal hazards and beach erosion (27 respondents) followed by tidal waves and sea swells (7 respondents) smallness of the island size congestion and smallness in size of the population (5 respondents).

Figure 58: Climate change and environmental degradation affecting migration/ displacement in the study sites according to the household survey



One respondent explained how: Beach erosion has started where it has been reclaimed on the eastern side of the island. Around 15 foot has eroded during the last 10 years all the sand that has been accumulated has been washed away. Out of the 46 coconut plants, two have been taken away due to beach erosion. Waste management is also a problem in this island. Nobody has thought about migration because of these factors.



Waste in Holhudoo island.

Another respondent explained that, “The ground water has turned salty. The water supplied to my house is from the well about 300 feet away. Even these wells turn saline when the rains are delayed.” There can be no doubt that the vast majority of respondents interviewed during this study in the Maldives consider beach erosion and coastal hazards as the main factor related to environmental degradation, however when the question was posed relating this to the movement of people or push factors for migration, nearly all the respondents indicated that the main factors influencing migration are the island’s remote/isolated location (in terms of population size or size of the island) and lack of mobility and service provision constraints such as education, health and jobs, and did not mention environmental factors.



Unhabited island near Holhudoo island.

Tidal waves have been impacting the people living in the eastern side of Male' city during every Hulhagu monsoon. Male' city which is one of the sites for this study, was hit by tidal waves on the 13 August 2015. Some eyewitnesses reported the waves to be five to ten feet tall. Tidal waves or Udha hit the islands during the Hulhagu monsoon season. Metrological services report that the tidal waves can be attributed to the times at which tides are high. On 11 April 1987, the whole of the Maldives experienced tidal waves which caused damage to property and displaced 300 people in the city of Male' and damaged 16 more islands. All the respondents in the four study sites stated that they have experienced tidal waves during the Hulhagu monsoon. However, there has been no recorded damage in any of the sites.

6.6.16 Sudden onset disasters, displacement and migration in the Maldives islands

The Maldives population has been displaced at a large scale during the 2004 Tsunami. The respondents from this study have identified tidal waves or Udha, flooding during the rainy season and water shortages as the main sudden onset disasters that have affected the communities or populations across the Maldives. Few respondents have mentioned the changing weather patterns and associated these factors with climate change. Some of the respondents have associated the changing weather patterns with climate change and related anecdotal evidence of flooding due to heavy rains and tidal waves. From the key informant and community level interviews, 75 per cent have responded to this issue more so from the central level key informants. There is a vast difference in the knowledge levels relating to climate change among the surveyed communities and the central level policymakers.

In the Maldives, climate change hazards are mainly confined to erosion and extreme weather conditions. Regular sea swells are getting more frequent causing the beaches to erode and making the communities more vulnerable to further sea swells. Local island communities have been displaced due to beach erosion. For example, the Hathifuhsi

and Kadholhudhoo communities have been exposed to tidal waves and sea swells. Small islands are more vulnerable and not safe from tidal waves and hazards. A climate observatory has been established on this island so that the community can get information for weather forecasts and predictions and people from distant islands and nearby island want to migrate to Hanimaadhoo. Small islands with bigger populations are also at risk of environmental degradation due to climate change-induced hazards and overcrowding; Kadholhudhoo is an example of a community that had to be moved, and such is the case in Sh.komandoo.

Displacement of populations affected by disasters

Flooding during the rainy season

Case study of Hathifushi: A testimony

Before the 2004 Tsunami there was abundance of trees in Hathifushi, such as coconut palms, breadfruit papayas, stone apple and other trees, which gave us fruit. After the Tsunami, most of the trees died and it was very difficult to grow these trees again. We used to sell the products from these trees and earn a livelihood. During the monsoon season the tidal waves came into our houses because the beach has eroded and the tidal waves (*Udha*) became more frequent during the Southwest monsoon. Hathifushi did not have any proper harbour facilities and during the Southwest monsoon the island has to be accessed by getting into a smaller boat and navigating through the lagoon, while the original boat has to be anchored way outside in the deep sea. The community of Hathifushi has been thinking about moving after the Tsunami because the island was so small. To access health facilities we had to visit the neighboring island of Huvarafushi. However since the island is comfortable and very beautiful, the community do not want to move to another island. I was educated on another island because in Hathifushi, the school only provided classes up to grade 7.

In 2007, my mother and father and my extended family of 14 members moved to Hanimaadhoo after the tidal wave hit the island. The whole island was flooded but my house is in the centre of the island and luckily the waves did not reach my household. I joined my family in Hanimaadhoo after completing my engineering course in the Faculty of engineering in the Maldives National University in 2009. We lived in rented houses in Hanimaadhoo for seven years, and moved to the housing unit provided by the Government. However, during this period we were given an allowance of MVR 500 per month per person by the Government.

Ibrahim Hussein Fulhu, H.DH Hanimaadhoo, Rihi faiy, 23 years.

Flooding is the most common hazard in the Maldives. In the four surveyed sites, flooding was pointed out as a disaster because the storm water stagnates in the depressions in the island and floods the roads. From the FGDs and the interviews, most people expressed these views. Flooding impacts the health of the communities, especially as it allows dengue to spread during the rainy season.

Flooding occurs mostly in the southern islands where mangroves or wetlands are present. Flooding affects the everyday lives of the communities living in these areas continuously every year during the Hulhagu monsoon. For example, in Holhudhoo, every hulhagu (south westerly) season when it rains the island gets flooded. In this area, the houses have

been raised to prevent the floodwaters coming into the house and community pumps are used to pump out the water from the roads when it is raining. Flooding restricts the movements of the population and causes outbreaks of waterborne diseases. Changes in weather patterns have a negative impact on the population's economic situation.

Communities do not think of migration as an adaptation strategy, instead they tend to adapt in-situ and think of alternative solutions to the problems faced. According to one respondent, "People from this island have not migrated because of the tidal waves or flooding, they migrate for educational purposes."

Water shortages during the dry season

Table 26: Types of drinking water in the number of households

Island	Type of drinking water				
	Well water	Rain water	Bottled water	Pipe	Other
Hanimaadhoo	59	52	47	0	0
Holhudhoo	60	57	57	2	0
Male'	139	138	138	0	0
Naifaru	60	59	59	1	0

Note: From household survey.

From the table above it can be seen that the communities rely on three types of water at the household level for their everyday use. Ninety-nine per cent of the households rely on well water, while 95 per cent rely on rain water and 94 per cent rely on bottled water. Piped water is used by a very minimal per cent of the households. All the households rely on these three types of water for everyday use in the households. During Iruvai, a number of islands run out of drinking water (rain water and bottled water) because the rain is delayed or there is a long dry spell. The National Disaster Management Centre (NDMC) has been providing water after the 2004 Tsunami (since the NDMC was established) to 80 of the inhabited islands of the Maldives. Since the ground water is contaminated due to the 2004 Tsunami, as well as other factors, such as extraction. The communities rely heavily on rainwater for drinking purposes. Water expert, Fathimath Saeedha, stated that:

there is no one overall solution to the annual water crisis, with different areas instead needing a 'tailor-made solution', every island has very specific needs which need to be addressed. Then only can we reach a permanent solution.

Umar Fikry, a spokesman for the NDMC, says that it has urged all island councils to inform it of water shortages in advance. "We are prepared and ready for the water shortages every year," Umar said. He says that islands usually report water shortages to the NDMC when they are down to one month's supply. "We spend an average of MVR 5 million (USD 330,000) on delivering water to the islands [each year]."

As Abdul Hameedh explained, "The NDMC has supplied 115 tons of water in April 2015, and in May 2015, 50 tons were supplied to fill in the community water tanks which are placed in the mosque. The capacity of the tanks is 150,000 tons." Densely populated small islands are more vulnerable to climate change induced hazards. The depletion

of freshwater resources due to over-extraction makes living in these communities a challenge. The three surveyed communities excluding Male' (Hanimaadhoo, Holhudhoo and Naifaru) mentioned that they face water shortages, although they do not request for assistance from the NDMC, as in the case of Holhudhoo.

6.6.17 Slow onset disasters, environmental degradation, migration and displacement in the low-lying islands of the Maldives

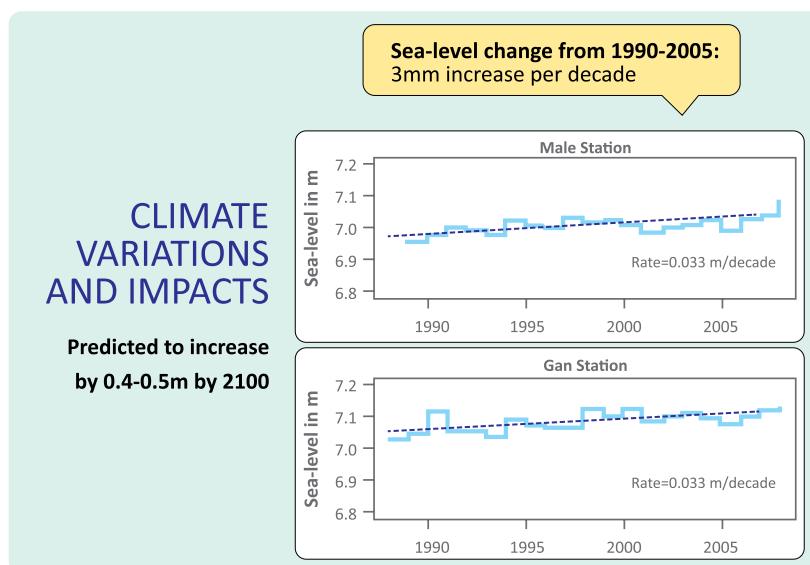
With regard to slow onset disasters, such as the sea-level rise, the surveyed communities are not aware of this phenomenon and that slow onset change could, in the future, lead to migration, but that currently the population does not identify these changes as a factor influencing migration. When presented with facts regarding sea-level rise in the past ten years during the qualitative interviews, the community members do not seem to be concerned or alarmed. They responded that they have been living in these islands for centuries and the islands will cope with the rising sea-levels as well. The respondents from the communities identified very well with visible factors, such as beach erosion and groundwater salinization as environmental degradation factors that have been happening over a long period of time and that have impacted on the household level and their livelihoods as well.

Coral health and coral bleaching due to changes in the temperature is another phenomenon, which is very alien to the communities in the study sites, as well as the whole of the Maldives. One of the study sites, Naifaru is a fishing community and very much dependent on fishing and fish processing as their main livelihood, however none of the respondents mentioned any aspects of overfishing, which is another threat to the coral reefs in the study areas. The respondents in the household level survey mentioned that fishing is not as good as before, stating that the fish stock is declining for reef fish. Maldivians used to eat pelagic fish instead of reef fish, so the fishing impacts on reef fish populations were minimal before. The fish used to keep the algae down in the reefs are being over exploited, and the result will be that the algae will overwhelm the coral, and the coral reef will die, or change from a coral reef to an algae reef. Human impacts on reefs are increasing, exacerbated by shark fishing, aquarium fishing and sea cucumber collection, which have changed the reefs. These activities were observed in all the study sites.

Ground water salinization has been mentioned in all the interviews and the household level surveys as one of the environmental degradation factors happening in the four study sites. The respondents in this study have observed changing weather patterns and the change in the temperatures. In the key informant interviews and the focus group discussions the respondents were introduced to these issues by showing the graphs below.

Sea-level rise and its impact in the future

The fact that environmental factors, particularly rises in sea-level, were perceived to be relatively unimportant migration drivers in the Maldives may perhaps seem surprising, however it needs to be noted that the respondents were shown factual graphs depicting the changes in sea-level rise from 1990 to 2005 and predicted increase in year 2100 was shown to all respondents before all the interviews. This approach was used because sea-level rise is a phenomenon, which to the respondents is very distant and heard only on the news. Even though the graph below was explained it took some time for the respondents to process this information and it was difficult to generate a discussion on the impacts of sea-level rise and the consequences for low lying islands in the future.

Figure 59: Sea-level change

Source: Srinivasan, G., Jothiganesh, S. and Subbiah, A. R. (2012).

Beach erosion and coral bleaching due to climatic factors and displacement

The communities rely very much on fishing and tourism as their main livelihood options. If their livelihoods are at risk then there is the possibility for people migrating to other places. The fishing, tourism sector and the protection of the beaches, which surrounds the islands, are dependent on the health of the coral reef ecosystem. During the El Niño event of 1998 the reef was degraded and 2015 has been documented as one of the hottest years in the history. Since all the study sites have mentioned that the beach erosion is one of the visible signs of environmental degradation, the communities do not associate beach erosion and the health of the coral reefs. The communities discuss visible factors and alienate themselves with the nonvisible factors, such as the health of coral reefs and sustaining the coral reefs, which is vital to safeguarding their beaches. There is also a dearth of knowledge and awareness of the scientific facts, such as global warming and ocean acidification. The communities hear about these issues in the news and do not associate these issues as happening to the reefs surrounding their own islands. Very few fisherman and community members dive and actually have knowledge and the know-how to identify healthy coral reefs or to understand the function of reefs in protecting the beaches. The reefs have been degrading due to development and infrastructure interventions as well. For example, the community members in the key informant interviews and the focus groups in Hanimaadhoo, have stated that the beach has been eroding after the harbour has been built.

Ground water salinization and its impact on the affected communities

In Naifaru, even though the ground water is polluted, people do not want to move because Naifaru has been a stopover point for the vessels travelling from the northern atolls to Male'. These stop-overs benefit the Naifaru community in terms of locals getting the opportunity to travel to Male' and sell supplies to passengers who use the stop-overs. The passage fee for these boats is MVR 200. The Naifaru community is trying to adapt

to the situation of the ground water salinization by assisting each other and trying other methods of catching the storm waters and replenishing the ground water table.

Case study from Holhudhoo Alivaage

Ahmed Zareer of Holhudhoo Alivaage narrated the case of this household where 17 members live. He stated that the ground water from the well in the house was so bad that he did not have any other option two years back other than installing a pipe system to another well which is a 100 feet away from his household. He also explained that the community police station gets their water for washing purposes from 250 feet away. The health centre where he works gets their supply of water from a well 350 feet away, which is situated in the old preschool building. His household uses mineral water for drinking which is bought and rainwater for cooking purposes, which they harvest at the household level the household, has 2 tanks with 2,500-liter capacity, which dries out during the dry season every year



A village in N. Holhudhoo. © 2015 (Photo: Fathmath Shafeega)

6.6.18 Perception of the communities of slow and current onset disasters and migration

In Naifaru, the respondents stated that people do not want to migrate to other islands due to the effects of climate change. On the other hand, they noted that people do migrate solely for educational purposes or in search of jobs and better health services. Of all the migrants that have left the island Naifaru, respondents mentioned that no one has ever migrated away due to the direct effects of climate change, but mainly for higher education and better access to health services. Nearby islands now have better educational facilities than Naifaru, which is a drastic change. Many people also migrate from Naifaru to other islands due to marriage and on average one family migrates away annually.

In Holhudhoo, the respondents made similar claims that no one in the island thinks of migrating to other islands as a result of climate change but rather for better education and job opportunities. However, it was also noted that problems due to climate change and environmental degradation can re-enforce their desire to migrate away from Holhudhoo even if it is initially for another purpose.

The people of Hanimadhoo do not wish to leave the island for anywhere else. The people who have gladly left Hathifushi and migrated to Hanimadhoo are extremely happy as the island offers proper education, better facilities and an easier life than in Hathifushi.

6.6.19 Gender and other vulnerable populations

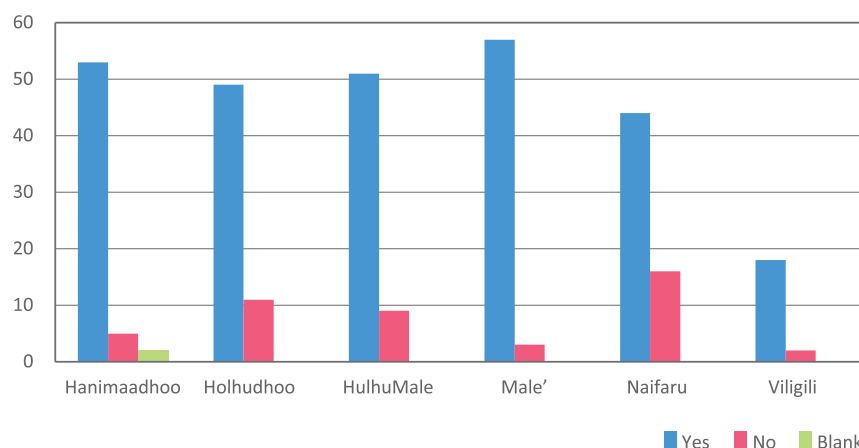
Women are affected differently by climate change

Table 27: Populations differently affected by climate change

Are women affected differently?	Total	Island					
		Hani-maadhoo	Holhudhoo	Hulhu Male'	Male'	Naifaru	Viligili
Yes	63.75	9.38	13.44	11.88	14.69	11.25	3.13
No	33.75	7.50	4.69	6.88	4.06	7.50	3.13
Blank	2.50	1.88	0.63	0.00	0.00	0.00	0.00
Grand Total	100.00	18.75	18.75	18.75	18.75	18.75	6.25

Sixty-four per cent of the respondents agree that women are differently affected by climate change. Around 33 per cent disagree that women are differently affected, as respondents argued that men and women bear equal consequences after a disaster. In the key informant interviews, participants raised questions on how women can protect the households. One participant stated, “if women only are present in the households, how can they put sand bags to protect the house from flooding which is the normal practice in this island.” In the mixed focus group discussions in Naifaru, all the participants agreed that women are affected greatly as they usually manage the water to wash and cook among other needs. However, men are not affected much as they are usually not in the islands and are away for work. Out of the 19 mixed group FGD participants, 6 husbands are working in resorts while for the males, none of their wives are working outside the island.

Figure 60: Migration of male members and implications on females



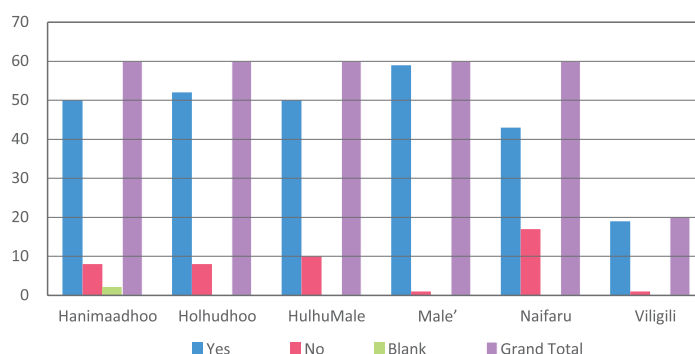
The majority of the respondents (85%) agree that when the males are absent there are implications for the women who are left behind. In the chart above, yes means that they are affected and no means that the respondents do not think they are affected.

In Naifaru, 4 out of 8 of the male-only focus group discussions work in other islands and only come to Naifaru once a week or once a month to visit their families. To reiterate this

point, out of the 10 participants in the women-only focus groups in Naifaru, 9 participants stated that all their husbands have migrated to other places to earn a livelihood. Most of the men of the island work in other islands and thus are not affected much by climate change, whereas women face these hardships every day. The women who are left behind walk their children to school every day, and when the roads are flooded, this is a great obstacle.

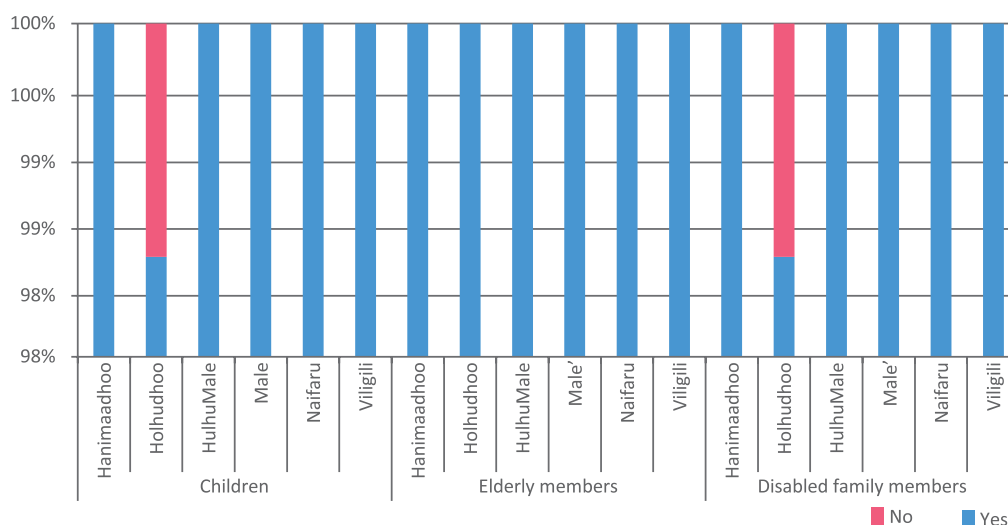
Similarly, in the Holhudhoo FGDs, all the members agreed that women would be adversely affected. As most men are not present in their homes the majority of the time and a large number of men undergo seasonal migration to resorts for employment, leaving houses to often be only inhabited by women and their children. Thus, it is difficult for women to handle the changes in lifestyle due to climate change while handling all the responsibilities without their husband's support. For example, during a flooding, it would be extremely problematic for women to use cement bags to block the doorways and prevent water from entering the house and take children to school by crossing completely flooded roads.

Figure 61: Migration of female members and implications on males and the responses



Although in the household survey, 85 per cent of the respondents have agreed that there will be implications for the males when females migrate, this issue was not discussed in detail because it was mainly the male members who migrate and are more mobile than the female members. The biggest industry, which provides jobs, is the tourism industry and females rarely go to work in the tourist resorts. This was observed in the study sites and is the trend in the whole of the Maldives.

Figure 62: Anticipated impacts of migration on vulnerable household members



The vulnerable population cohorts are the elderly, the children and the disabled, as shown in the above graph. A hundred per cent of the respondents agreed that the elderly would be affected in the migration process. Ninety-nine per cent agreed that disabled people and children would be adversely affected.

6.7 CONCLUSION AND RECOMMENDATIONS

Since the whole of the country is coastal, and environmental degradation affects marine and coastal areas, the whole country can be considered to be very vulnerable to climatic hazards. During the 2004 tsunami, 13 islands were evacuated and 15,000 lost their homes. During the tidal waves of 2007 the community of Hathifushi was relocated. Movement of people from one destination to the other has been documented to be taking place due to natural disasters as well as other economic and social factors. Movements of people from smaller more vulnerable communities to potential growth centres has always been on the agenda of the respective governments.

People's decisions to move or migrate from one place to the other has been based on non-climatic factors. The most important factors are the provision of university and higher education facilities and for better health facilities and job opportunities. However it is also worth mentioning that some of the push factors, such as natural hazard factors, have compelled whole communities to migrate. During the survey, it became clear that the elderly do not want to move to a flat system of housing which they are not used to, however the youth want to move to urban centres, especially Hulhumale'. Currently, many requests have come from communities such as Noomara and the Housing Ministry intend to undertake the community consultations in the future at the council and community level.

In all of the studied sites the trend has been that the young male members of the household migrate for better livelihood options and send remittances home while the elderly men and women (young and old) and the children are left at home. In the fisheries sector, which is a male dominated sector, only the men go out fishing and the women are left at home. This is similar with the tourism sector because of the belief system among the Maldivians the parents do not allow their daughters to go and work in the tourist resorts. These two sectors provide the most job opportunities in terms of livelihoods in the whole country. There have been issues identified by the respondents of all FGDs conducted in the four sites with regard to the men who are working in other locations, not sending remittances home, resulting in court cases and ultimately leading to separation and the women trying to earn a different livelihood to look after the family.

Migrant households have stated that although the family receives remittances, it is difficult to save. Only three households out of the 320 household surveyed (150 households were migrant households) have expressed that they can save after covering their daily expenses. The migrant households also have to pay for the rent of the houses they are living in which is an additional burden compared to the non-migrant households. The rent of houses is comparatively high, especially in Male' and the greater Male' area.

Migration and relocation of communities is not planned, and usually communities take the initiative to relocate in an ad hoc manner. When the whole community requests that they want to move, the housing ministry undertakes a survey. Small communities are encouraged by the government to move to bigger islands or growth centres, for example, to Hanimaadhoo, Nolvivranfaru and Kulhudhuffushi in the north. Consultations have

been undertaken at the atoll and island council levels if a community wants to relocate or migrate. In Molhadhoo (one of the communities in the process of relocation), community consultations have been undertaken with the whole community before people were relocated. Input was sought from the most influential leaders in the community. However proper consultations are yet to be undertaken to avoid issues of integrating the host and migrant communities in the process of relocation. Host communities and migrant communities have issues and differences, and these issues need to be resolved.

This study has shown that very few families are able to save from the remittances sent home by the migrants living away from home and thus limited saving capacity means greater vulnerability for households, especially those exposed to disasters, as it means they have fewer assets and financial means to recover and rebuild following disasters. At the same time, having family members working abroad can constitute a safety net for these families, who can potentially count on their relatives' support in the event of a disaster.

Recommendations

It has been observed in the case of the Maldives that relocation of smaller communities has been promoted to provide the necessary services needed for the communities. This concept has been promoted through the population consolidation policies of the Government. However, as stated in the climate change policy, a national coordinating mechanism or national coordinating body needs to be in place to ensure that all movement of populations are planned and coordinated. Several suggestions are given below in this regard:

Policy framework

- The policies that have been designed by the respective institutions are not evidence based and need to focus on this aspect when designing future policies on climate change and migration. This is most evident in the population consolidation policy of the government, as it has changed with each government.
- A long, medium and short-term strategy for planned relocation and also for migration and displacement needs to be designed by the respective government authorities for planned movements due to climate change-induced hazards and these policies to be accessible to all.
- Include displacement and migration issues in the current climate change policy to ensure that these policies holistically incorporate human mobility issues in the context of environmental degradation and climate change.
- Develop guidelines and principles for comprehensive disaster risk assessments, to identify key vulnerable sectors identified in the NAPA and other planning documents for preparing adaptation to vulnerabilities faced by the communities. Climate SMART building codes need to be in place, which are customized to the respective islands.
- The newly designed policies should integrate ways of providing support and capacity building for family members left behind who are the elderly, children and particularly women who often have to take on increased workloads. Such support should include alternative livelihood training and the introduction of more efficient methods of agriculture and entrepreneur skills.
- Have a policy in place for climate change-induced migration, with the assistance of a legal framework to support climate change policy.

- Considering the lack of policy and institutional arrangements to manage internal migration, it is of utmost importance to develop a “national coordinating body” for relocation and migration.

National Level

- Facilitate consultations about planned relocation as a DRR strategy with those affected, and host communities to ensure that any such move is implemented with the full participation of both relocating and host communities, and with full respect for human rights and the principles of non-discrimination. The aftercare aspects and the integration of affected communities into the host communities needs to be incorporated when designing policies for relocation.
- Consider the introduction of new technologies to enhance existing knowledge and practices and to rectify any maladaptation. These should include water security measures, preventive measures to address beach erosion, and mixed farming and aquaculture, crop diversification and alternative cultivation methods that increase yield and improve soil quality.
- The decision of people to move or migrate from one place to the other has been based on non-climatic factors. The most important factors, being the provision of university and higher education facilities and for better health facilities and job opportunities. However, it is also worth mentioning that some of the push factors, such as natural hazard factors, have compelled whole communities to migrate.
- In all of the studied sites, the trend has been that the young male members of the household migrate for better livelihood options and send remittances home, while the elderly men, women and the children are left at home.
- The health and economic aspects of flooding need to be considered when designing policies.
- A National Plan that addresses long, medium, and short-term climate-induced migration and relocation, needs to be developed at the national level. The LGA and the councils need to implement the plans.
- Internal and international migration databases need to be developed and monitored by the National Bureau of Statistics.
- A national development plan is needed which considers how all sectors are impacted.
- At the national level, the implementation of policies must be strengthened and climate change policies put in place.
- Consider the benefits of migration, and how migrants and diasporas can contribute to resilience and adaptation to climate change. There are numerous examples of good practices involving diasporas in adaptation projects, through skills transfer or through State-led investment opportunities.

Capacity-building

- At the island level, the challenges and needs of the population have to be documented and capacity-building is needed to document these issues to advocate at the national level. At the atoll level, there needs to be more capacity-building.
- At the national level, policies need to be designed to promote the benefits of migration and relocation.

- People who work at the policy level, need to be informed about the issues and oriented regarding possible solutions and policies that need to be designed. This can be done through capacity building workshops, through the production of more policy-oriented research and policy briefs, and through improved dialogue between researchers and policymakers.
- Advocacy is needed to promote the DRR strategy, potentially by the NDMC, Red Cross and Red Crescent Society to create awareness of the issues and strategies.
- Community level.
- Provide context-specific low cost technological options, especially in agriculture and water supply.
- Programmes and projects need to be initiated to protect natural resources, such as the coral reefs and ground water resources.
- Establish mechanisms for data collection, advocate on environmental degradation issues, and build the capacity of the atoll and island level governments to improve their reporting.

7

THE NEPAL CHAPTER – FINDINGS OF THE STUDY

Nepal lies on the northern boundary of the South Asian sub-continent with the Himalayas to its north and the Indian Gangetic plains to the south. Its location makes Nepal an ecologically and demographically diverse country. The topography varies from high mountains and alpine pastures in the north to the sub-tropical hills and plains in the south. The geographical variation, on the one hand, supports a large number of flora and fauna and livelihood options for its people and, on the other hand, poses severe environmental threats to the natural resources and humans. In addition to being located in a zone with high seismic activity, the country is regularly hit by epidemics, fires, floods, landslides, and various forms of climatic hazards (e.g. droughts and extreme temperatures) (IOM, 2013). This forces people to practice several natural-resource-based livelihood strategies depending on their location in different climatic zones. The fragile ecological diversity of the mountains, hills and plains (Tarai) is directly linked with livelihood options such as subsistence farming and livestock rearing (Synnott, 2012). These range from semi-nomadic pastoral and trading communities in the mountainous regions to subsistence farming in the mid-hills with a few fertile river valleys (SAWTEE, 2002). The southern Tarai plains have been turned into vast farmlands, and now emerging towns, out of thick forest covers that were cleared for resettlement of people from the hills after eradication of malaria in the 1950s (Regmi, 1994; Gartaula and Niehof, 2013).



Agriculture still plays a major role as the single largest livelihood option as well as absorbing the under-employed. Around 60 per cent of the total working population of Nepal, including 73.6 per cent females and 50.5 per cent males, are engaged in agriculture,

forestry and fishing (CBS, 2014). Agricultural practices in the country still rely primarily on manual labour, as modernisation of agriculture has been slow and/or impractical due to various reasons including the topography and climatic conditions, with rain-fed agriculture being the main feature. As elsewhere, this has led to diversification of income sources, and people have adopted a range of livelihood options including outmigration (Müller-Böker and Thieme, 2007; Shrestha, Velu and Conway, 1993).

Migration as a supplementary and/or complementary income-generating strategy has been a feature of Nepali society for at least the last two hundred years as “[migration] for supporting and earning livelihoods was/is of prime concern to people in recent past as well as in present times” (Adhikari, 2008:18–9). This includes migration for trade and/or (seasonal) migration to urban areas and India for cash income (Müller-Böker and Thieme, 2007). With erratic monsoon rains and other climatic hazards becoming more frequent along with a burgeoning population and under-employment, migration has increasingly become a major component of livelihood strategies for the people of Nepal (Manandhar et al., 2011). Politico-economic changes in Nepal in the last two decades have also contributed to migration in search of better livelihoods in recent days (Sharma et al., 2014). Further, the frequent occurrence of natural disasters in various parts of the country forces individuals and families to move out of their homes or locality and shift to a different location.

With the understanding that the MECC nexus in South Asia is not well researched, this research was carried out to explore the MECC nexus in Nepal. For this, the report seeks to bring together the secondary literature on MECC and substantiate the issues through primary research. This Chapter on Nepal is divided into two major sections. The first section looks at the existing literature and policy regime that guide the MECC nexus in Nepal. Due to the scant available literature on the issue of migration, climate change, environmental degradation, and natural disasters, these issues are also looked into separately in many places. In addition to looking at previous research and publications, the literature review also closely examines the existing legal framework in Nepal and the institutional arrangements available to explore MECC. The second section of the report is based on a mixed-method field study that was conducted in Darchula district of Nepal. The findings from the study are presented in this section. The report ends with recommendations and the way forward based on the conclusions of the study.

7.1 LITERATURE REVIEW

The existing limited literature on the relationship between migration and climate change in Nepal is not sufficient to indicate a direct link. However, it suggests that migration is an important part of the response to the subsistent nature of agricultural activities and limited resources, and a major avenue to diversify livelihood opportunities. Records also show that though migration has always existed in some form or the other; the number of people migrating have seen dramatic rise in the last two decades or so, prompted by a number of reasons including globalisation or threats to livelihood brought about by increasing population, environmental degradation, and climate change. This, of course, should be seen in light of “little consensus between researchers about the relationship between environmental change and migration” (IOM, 2009:14). Due to “[t]he multi-causal nature of migration [posing] a challenge in identifying environmental factors as the primary driver of migration” (IOM, 2009:17), compounded by a range of social, economic, and political factors (ADB, 2011:1).

Although there have been a number of studies conducted to understand the relationship between livelihoods and migration, the paucity of literature exploring the linkages between migration and climate change-related impacts suggests a need to better understand the relationship and identify policy innovations and changes. It can be stated with certainty that migration in/from Nepal will continue for the foreseeable future; however, it is uncertain what impact climate change will have on migration rates and routes even though effects of climate change are beginning to be felt.

7.2 ENVIRONMENTAL HAZARDS, DISASTERS AND CLIMATE CHANGE

The Himalayan mountain range and the South Asian Monsoon play a major role in Nepal's climate (NCVST, 2009) with marked variations due to the changing topography in short distances. Nepal receives about 1800 millimetres of mean annual rainfall (Government of Nepal, 2010) with a high degree of observed temporal variation from eastern to western and southern to northern parts of the country. In general, the Eastern, Central and Western regions receive higher rainfall compared to the Mid-Western and Far-Western ones (Government of Nepal, 2013). Similarly, rainfall decreases from south to north till the foothills of high mountain region and then declines sharply northwards behind the major mountain ranges (MoE, 2010a). Temperature varies from tropical heat of the Tarai to the mountains/ Himalayas; the 'average temperature decreases by 60C for every 1000 m gain in altitude' (Jha, 1992, cited in Government of Nepal, MoFSC, 2002). "The combination of geological, topographic and hydro-meteorological features in Nepal exposes the country to frequent and severe natural hazards" (IOM, 2013:254).

The Nepal Climate Vulnerability Study Team (NCVST) (2009) report presents a study of "eight signature [climate change] events" and draws attention to the fact that "far-off climate-related" events can have devastating local impacts. The local impacts can range from extreme events of floods, droughts to forest fires, and water-related diseases. The study also concludes that the existing climate change knowledge on Nepal includes the following: a) significant warming, especially at higher elevations; b) increased climatic variability and the frequency of extreme events, including floods and droughts; and c) overall increase in regional precipitation during the wet season but decrease in precipitation in the middle hills (NCVST, 2009). This suggests that climate-related events are likely to increase in the future.

A study by Agrawala et al. (2003) argues that climate change is already having discernible impacts and goes on to rank the potential risks to important sectors in Nepal (Table 28).

Table 28: Priority ranking of sectors to climate change

Resource/ranking	Certainty of impact	Time of impact (urgency)	Severity of impact	Importance of resource
Water resources and hydropower	High	High	High	High
Agriculture	Medium-low	Medium-low	Medium	High
Human health	Low	Uncertain	Uncertain	High
Ecosystem/Biodiversity	Low	Uncertain	Uncertain	Medium-high

Source: Agrawala et al., 2003.

The table shows that the impact of climate change will be felt most in the water resources sector, which can translate into both cutting off access and damage caused by extreme water-related phenomena. This means that the continuum from erratic and intense rainfalls to extended periods of drought would be more frequent. While the study suggests severity of impact on agriculture, it also highlights the importance of agriculture to the people (Agrawala et al., 2003).

7.2.1 Extreme rainfall

Nepal receives around 80 per cent of the annual rainfall during monsoon season from June to September (NHRMCC, 2015:9). This uneven distribution and large concentration of the annual monsoon in a few months results in heavy rainfalls, leading to floods, landslides, and soil erosion from already fragile slopes. The regularity of landslides has been rising in Nepal, especially since the 1990s (Chaudhary et al., 2015). In addition, floods in the Tarai also are growing in severity and regularity (Lamichhane, 2011). Landslides and flooding not only affect people's livelihoods but also cut off access to aid in times of such crisis by damaging infrastructure. Although floods are ingrained into the livelihoods because of their regularity in many South Asian societies, climate change is believed to exacerbate their effects (Fritz, 2010). However inured the communities are, the devastation and loss of life and property cannot be discounted. For example, in June 2013, an extreme weather event caused heavy rainfall in the Western, Mid-Western, and Far-Western regions of Nepal and adjoining Indian districts over a period of three days. The resultant flood affected hilly as well as Tarai districts. Estimated losses included 77 buildings collapsed, more than 300 families displaced, 2000 houses inundated, additional 600 families at risk, and 21 dead.

7.2.2 Droughts

The havoc caused by heavy and erratic rainfall can be disastrous, but drought also causes considerable problems. Drought in Nepal mainly results from the failure of the summer rains (South Asian Monsoon), and it is exacerbated by scarce winter rains (November to February) as this affects the crop-planting cycle of the farmers. In a study of drought in central Nepal, it was noted that there is increase in severity and frequency of droughts, especially for longer time scales, with the summer season of 2004, 2005, 2006, 2009 and winters 2006, 2008 and 2009 being the worst widespread droughts (Dahal et al., 2016). Another study, based on analysis of rainfall records, also noted that even as intense rainfall was occurring in fewer days, periods of drought were becoming longer (WECS, 2011). The western part of Nepal is particularly susceptible to droughts with "consecutive and worsening winter drought conditions since 2000" (Wang et al., 2013). In recent years, the 2008 drought was particularly bad with Nepal not receiving any rains for eight months (NCVST, 2009).

The consequences of drought are not only felt in the livelihood options but more on a daily basis as water sources dry up. A study of eastern hills in Nepal observed that droughts will lead to switching to more drought-resistant crops and decrease in livestock numbers and households needs being fulfilled by fetching water from ever-decreasing and far-away water sources from lower down the slopes (ICIMOD, 2009a). This, subsequently, leads to hardship, unsanitary conditions and outbreaks of diarrheal diseases (NCVST, 2009).

7.2.3 Rising temperature

Increasing and severe droughts are associated with an increase in temperature even though there is no direct linkage. However, the average temperature in Nepal is rising faster than the global average (Dhakal, Silwal and Khanal, 2010). Several studies indicate that between 1977 and 1994, Nepal's average temperature rose by 0.06°C per year, with higher altitudes experiencing higher temperature rise and warmer winter months throughout the country (MoE, 2012). Likewise, between 1975 and 2006, Nepal's maximum temperature increased by 1.8°C, with regional variations (NPC, 2011:7). The topographic variations in Nepal produce different localised climatic effects as well. For example, in western Nepal, air temperature has increased by nearly 1°C since 1990 (Wang et al., 2013). Various climate change models have projected that the mean temperature of Nepal will increase by 1.4°C by the 2030s to 4.7°C by 2090 (NCVST, 2009). This translates into warmer temperatures and associated variability and risks, among others, of rainfall, floods, and increased snow melt in the mountains.



"We had sufficient rain with a dense forest in the past but now flooding occurs every year due to overexploitation of the forest and the rainfall is erratic in nature"- 73 years old resident of Jogidaha Village Development Committee (VDC) ward number 7, Dhangadi Tole of Udaipur district.

7.2.4 Glacial Lake Outburst Floods (GLOFs)

While snow melt is a natural phenomenon that occurs annually during the summer months, the warming climate has exacerbated the formation of glacial lakes high in the headwaters of many Himalayan river systems (Ives, Shrestha and Mool, 2010). When the dams containing these glacial lakes fail, the effect of a wall of water cascading down a narrow river valley tends to have catastrophic consequences for people and river systems downstream. These cataclysmic events are known as glacial lake outburst flows (GLOFs). In Nepal, most of the fertile valleys are located along rivers with their headwaters in the

mountains, so any GLOF event will likely result in loss of life, property, and livelihood as well. These disastrous events have been recorded in history and memories. In Nepal, it was only after the 1985 outburst of Dig Tsho in the Everest region that caused much damage up to 60 kilometres away that these glacial lakes began to be studied and monitored (ICIMOD, 2011). Glacial lakes are thought to be the “most visible and dramatic” result of global warming, and there are more than 2300 in Nepal and 26 have the potential to burst their banks and cause massive damage (MoHA and DPNet-Nepal, 2015).

7.2.5 Environmental degradation

Another phenomenon that is a product of and contributor to climate change and associated risks is environmental degradation. As noted earlier, landslides and floods destroy large swathes of usable land. Environmental degradation also includes destruction of resources other than land such as forests, water, and air. The problem of environmental degradation in Nepal mainly stems from a rapidly growing population and over-exploitation of resources (Shrestha, 1994). These range from over-extraction of fuel, fodder, timber from the forests to expansion of cropland in steep slopes and overgrazing by animals. Deforestation, overgrazing, intensive agriculture along with heavy rains, earthquakes, and GLOFs cause soil erosion although, in Nepal, the latter is caused by more by natural processes than human activity (Shrestha, 1997), which underscores the likely effects of even a slight climate change on the steep slopes of Nepal. The effect of soil erosion will be a possible decline in agricultural production of staple crops such as maize and millet due to nutrient loss (Tiwari et al., 2010). This means that the already subsistent agriculture will become severely vulnerable to changes in the environment.



The increase in the volume of sand every year makes the Sundarpur village in Nepal more vulnerable to flood.

Besides drying up of water sources and consequent effect on agriculture and household use, available sources also do not provide potable water. In a study in a village in Myagdi district in the western mid-hills of the country with high diarrhoea prevalence rate, it was

found that the water was contaminated not only with coliforms but also arsenic (Aryal, Gautam and Sapkota, 2012). The presence of arsenic in a hilly district was unheard of though it has already become a problem in the plains of Nepal where 90 per cent of people depend on groundwater (Kayastha, 2015). The use of arsenic-contaminated water in drinking, cooking as well as other purposes is dangerous to health in the long run.

Environmental degradation illustrates that Nepal is not only vulnerable to climate change-related disasters but also over-extraction of natural resources. Along with climate change, vulnerability of people to its negative impacts also rises. Nepal is ranked fourth out of 170 countries in the “extreme risk” category in the new Climate Change Vulnerability Index (CCVI) 2011 that assesses, among other factors, “exposure to climate-related natural disasters...human sensitivity, in terms of population patterns, development, natural resources, agricultural dependency...future vulnerability by considering the adaptive capacity of a country’s government and infrastructure to combat climate change.” One estimate (JVS/GWP-Nepal, 2015) puts the number of “highly vulnerable” people in Nepal at about 1.9 million people, while another (MoE, 2012) estimates 10 million as “exposed to increasing risk.” Importantly, there is some evidence showing that the poor in the mountains will bear the burden as the impact of climate change becomes more severe in the future, thereby showing strong adverse linkages between poverty and climate change (Gentle and Maraseni, 2012). The worst impact will be felt by the poorest section of the population as they have the strongest bond with the ecosystem, which are sensitive to climatic changes (Sharma, 2009).

It is obvious that Nepal is prone to various kinds of disasters. In multi-hazard assessment modelling, considering the hydro-meteorological, geological and health hazards, up to 55 districts and 24 districts of Nepal are vulnerable to at least three kinds of disasters under a six-hazard and five-hazards modelling respectively (MoHA et al., 2010: 86-7). One of the first impacts will be the problem of food security. Changes in temperature or decline or heavy rainfall will result in droughts or flooding; it will affect paddy and other food crop plantations, since only 42 per cent of land is irrigated (NCVST, 2009). This does not take into account the subsistence hill farming, which will be affected more severely as agriculture is always vulnerable to floods and drought. Synnot (2012) argues that marginal groups are the most vulnerable to food insecurity due to any climate change-induced weather events.

As the poor and marginalised feel the brunt of any immediate impact of climate change and environmental degradation, they will search for alternative livelihood opportunities. As a result, one of those options is the rise in migration amidst the impact of shrinking livelihood opportunities that is becoming a modern phenomenon in Nepal. Sharma (2011: 12) succinctly argues that, in the “context of rapid livelihood and environmental change”, migrants [and migration by corollary] have to be understood “not merely as ‘reactors’ in the face of environmental and associated changes in agrarian and other forms of livelihoods, but also as active ‘actors’ aware and capable of taking timely action to cope with such changes (Sharma, 2011).

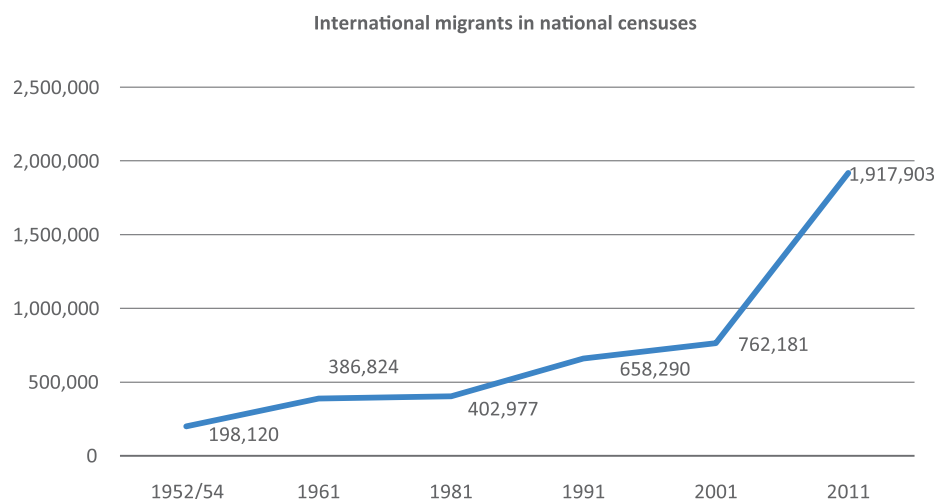
7.3 FORMS AND TRENDS OF MIGRATION

Despite unclear and complex linkages between migration and climate change, migration is gaining prominence and importance in Nepal, especially as a livelihood strategy. As alluded to earlier, migration has had a long history and several forms, however its causes and consequences have not been studied systematically.

The earliest form of migration and mobility in Nepal involved bartering food for salt from Tibet, or working as artisans there, in the armies of the kings of Nepal [and Indian principalities and British India], and later bringing salt and goods from India (Adhikari, 2008). Nowadays, people move to India and urban areas of Nepal as seasonal migrants to earn money when workloads in the farms/villages are low, usually between planting and harvesting seasons (Sharma and Thapa, 2013). While long-term labour migration to foreign countries and in larger numbers is a recent phenomenon, there is also internal migration in the form of “rural-to-rural and rural-to-urban areas in search of employment and educational opportunities” and displacement due to “occasional natural calamities like floods and landslides” that force “people to flee from their birthplace to other potential areas for their livelihood” (KC, 2003:130).

In an exhaustive assessment of migration survey literature on Nepal including the national censuses, Sharma and Sharma (2011) find that the focus has been on numbers and destinations and reasons (explanations) for migration but not its causes (conditions leading to migration). The decennial censuses since the first one in 1911 have focused mainly on migrant numbers and destinations though only since the 1952/54 census that absentee population (defined as anyone away from home or abroad for more than six months) details were recorded following a scientific statistical method. The censuses show that migrant numbers have increased gradually over the decades, but markedly only in the last decade (Figure 63).

Figure 63: International migrants in national censuses (number of people)



Source: Khatiwada, 2014.

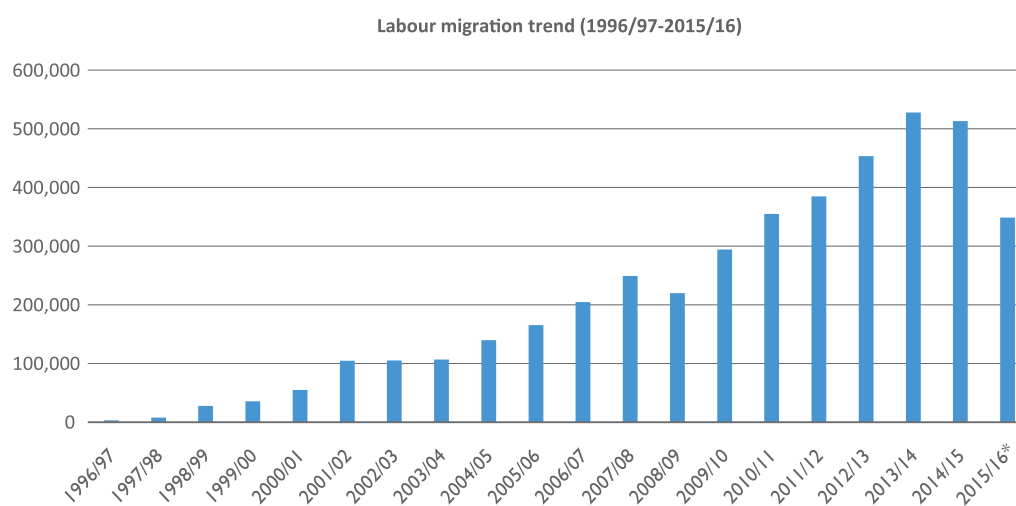
Sharma and Sharma (2011) also report that the studies record the reasons for migration which range from socioeconomic to cultural factors. The most cited reasons in the studies can be categorised into two main list of variables: first, life opportunities, and second,

livelihood opportunities. While the often-cited reasons of family tradition of migration (to join foreign armies or jobs in India), for economic survival/advancement, and lack of educational/medical facilities/employment – that could be considered life opportunities – might give the impression of choices available to potential migrants, but for the majority of migrants, the reasons are more mundane such as insufficient land and/or income to meet the consumption needs of the family. The latter point underscores the motives of the migrants as arising out of livelihood opportunities and compulsions.

7.3.1 Labour migration

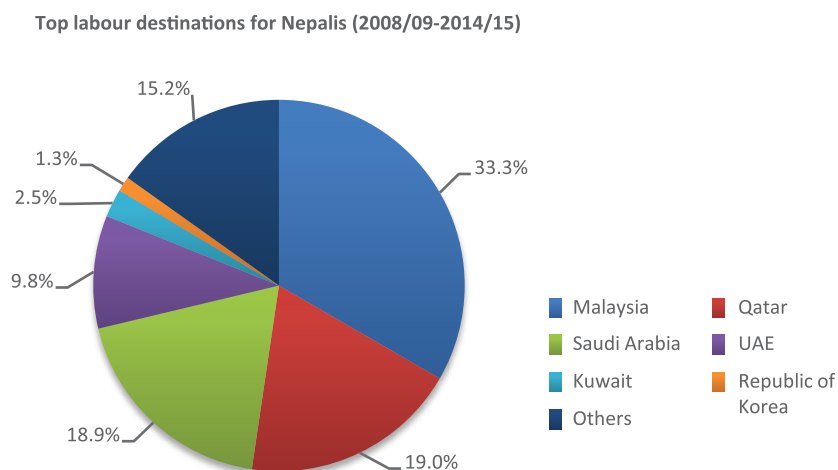
Both opportunities and compulsions have combined to effect a surge in migration for labour in the last 20 years. These 20 years saw the country go through a decade-long war with severe lag in development programmes, return to peace politics and transition to a republic, long political deadlocks, and a manifold increase in migration for labour. Further, the figure below portrays the number of labour migrants in the past two decades who have engaged in foreign employment in various international destinations after getting required permits from the DoFE. Because of the open border between Nepal and India, and because Nepalis do not require any labour permits to work in India, there is no record of Nepali labourers working in India (Sharma and Thapa, 2013) (see section 2.2.3 Migration to India); the figure below, therefore, does not count them.

Figure 64: Labour migration trend (number of labour migrants by year of migration)



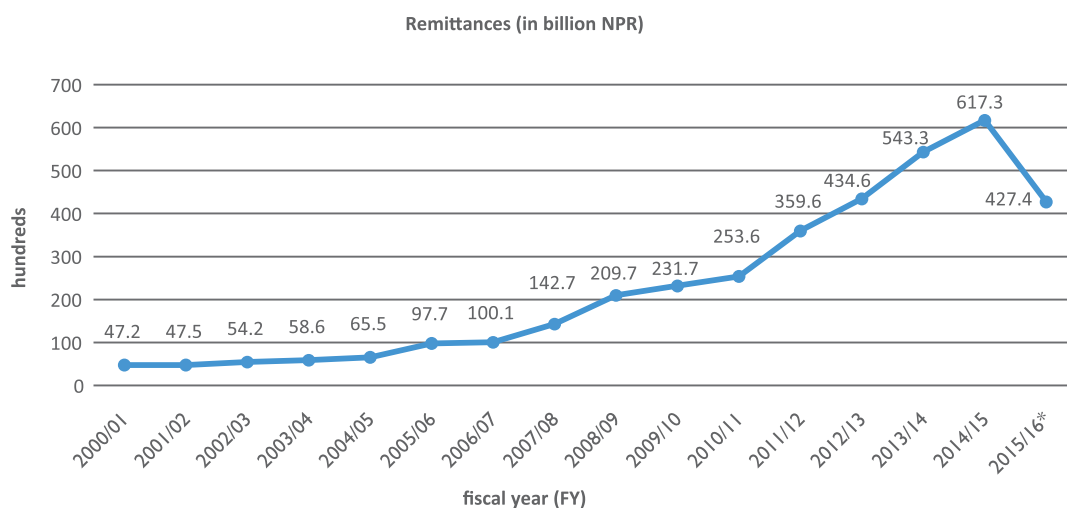
Source: MoLE, 2016 (*based on data for the first ten months of fiscal year 2015/2016).

Although Nepalis have found more than 142 destination countries to work in, the figure below highlights the destinations in which the DoFE released the labour permits between 2008/2009 to 2014/2015. As the DoFE does not count the migrants to India, which is the obvious primary destination for a large number of Nepalis (see section 2.2.3 Migration to India), only the countries that require labour permits are represented here. Malaysia was the destination for one-third of the Nepali labour migrants in the period of six years (2008/2009–2014/2015) while the Gulf Cooperation Council (GCC) countries, together, absorbed more than half of the Nepali migrant labourers (MoLE, 2016).

Figure 65: Top labour destinations for Nepali migrant workers (2008/2009–2014/2015)

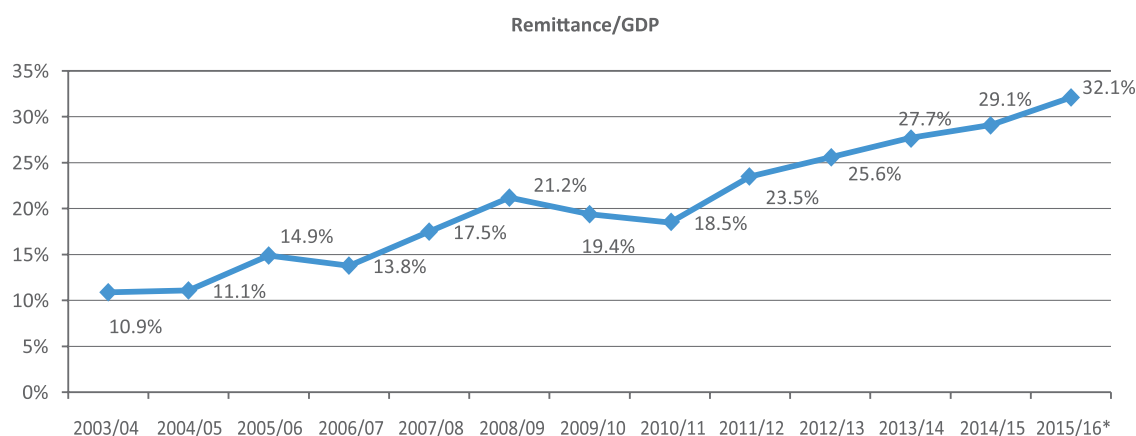
Source: MoLE, 2016.

Along with the steep rise in labour migration, there has been a corresponding increase in financial remittances (Figure 66). Remittances are beginning to not only play a big part in the national economy in terms of balance of payments but also in consumption spending-driven economic growth.

Figure 66: International remittances received by Nepal (in billion Nepali rupees)

Source: MoF, 2016 (*based on data for the first eight months of fiscal year 2015/2016).

Remittances have been increasing at such a rate that it is now the single biggest source of foreign currency for Nepal. The ratio of remittances to national GDP was 29.1 per cent in 2014/2015 and is projected to be about 32.1 per cent in 2015/2016 (MoF, 2016).

Figure 67: International remittances received by Nepal (in billion Nepali rupees)

Source: MoF, 2016 (*based on data for the first eight months of fiscal year 2015/2016).

At the household level, the major effect of remittances has been a substantial role in the reduction of national poverty levels from 42 per cent in 1995/1996 to 23.8 per cent in 2012/2013 (NPC, 2013) where “remittances was responsible for one-third to one-half of the overall reduction in headcount poverty rate” and the impact may be greatest in decreasing the severity of poverty (Ratha, 2013). In a global estimate, it is suggested that “A 10 per cent increase in official per-capita remittance leads to a 3.5 per cent decline in the proportion of people living in poverty” (Adams and Page, 2006, cited in World Bank, 2011:1). It was also argued that, in Nepal, between 1995/1996 and 2003/2004, “the increase in the incidence of remittances accounts for a 3.9 percentage points decline in poverty rate, or over one third” (CBS et al., 2006:56–7; see also Sharma et al., 2014:65–74). Remittances also improve consumption and investment in education and other assets (Shrestha, 2008) as remittances are primarily spent on consumption, housing, and land (Pant, 2011). This has the effect of reducing poverty and vulnerability of recipient households and communities (Pant, 2006).

7.3.2 Rural to urban migration

Migration for labour to international destinations, while significant for its contribution as a livelihood options in the case of Nepal, has received wide attention from policy and research circles, but it has overshadowed internal migration for various purposes that is also growing as urbanisation is occurring rapidly (Sharma et al., 2014). The World Migration Report (IOM, 2015) highlights that internal migration to cities is yet to be considered by urban planners and policymakers globally.

In Nepal, there is predominance of rural to rural migration but rural to urban migration is gradually rising, indicating increasing urbanisation and growing employment opportunities (Suwal, 2014). Although Nepal’s census enumerates economic reasons for migration only, the “important causes of internal migration in Nepal have been poverty, inequitable distribution of income, unemployment, difficult livelihood, and food insecurity” (KC, 2003). Literature shows that “rural-urban migration can also be looked at a family migration which emphasises migration of a family member as a way to diversify the risk associated with family earnings in the absence of rural insurance market and or when

income diversification opportunities in rural areas are scarce” (Timalsina, 2007:26). Also, as “[e]conomic migration favours males more than the females” (Suwal, 2014:263), the impact of migration on left-behind family members, especially women, results in increased burden of work besides issues arising out of separation.

7.3.3 Migration to India

Because of the historical, social and cultural ties between the two countries, migration to and from India is a common phenomenon for Nepal. The historical trend of migration is also facilitated by the 1850-km-long open border that the two countries share. The 2011 census of Nepal recorded 722,255 Nepali individuals living in India for various purposes at the time of the census (CBS, 2014). The number in the 2001 census was 587,243 (Kansakar, 2003). Migration to India is undertaken for three different purposes: a) recruitment into the Indian Army; b) permanent migration; and c) seasonal/temporary migration for work (Sharma and Thapa, 2013). As mentioned earlier, many individuals, mostly men, from the mid- and far-western Nepal, including Darchula, travel to India for work on a short-term basis during the off-farm season. This, over the years, has become an important livelihood strategy, especially because agricultural productivity is declining (Sharma and Thapa, 2013). Apart from this, forced migration in the form of human trafficking from Nepal to India and other countries has also been identified as a rampant issue. Among others, the most popular sectors of such trafficking are the sex industry, “construction, factories, mines, domestic work, begging, and the adult entertainment industry”.

Interestingly, there is no policy between Nepal and India that guides the regulation of migrants or the protection of their rights. The highly controversial “Treaty of Peace and Friendship between the Government of India and the Government of Nepal” signed in 1950 has only two articles that refer to equal treatment of the national of the other country in regards to “residence, ownership of property, participation in trade and commerce, movement and other privileges of similar nature” (Article 7). A further exploration of this is carried out later in this chapter.

7.3.4 Impact on different genders

It is by now a well-understood fact that the impacts of climate change and disasters is different on men and women. This is also highly dependent on the already set rules and responsibilities of different genders in any given society. In male-dominated societies, it is observed that women face additional burden posed by the climate change stressors (IOM, 2014). Further, the consequences of male outmigration in traditionally male-dominated societies have been borne by the left-behind family members, especially the women. Along with familial and social complexities arising out of separation, the left-behind family members and children fall behind in access to health and education and the female household members have to look after the children and their own, affecting physical, psychological and emotional health (Bajracharya and Bhandari, 2014:105). With increasing numbers of male migration, women have to take up additional responsibilities of agricultural work, leading to feminisation of the agricultural sector (Maharjan, Bauer and Knerr, 2013). In addition, male migration is shown to adversely affect the ‘labour market participation of women left behind in Nepal’ (Lokshin and Glinskaya, 2009, cited in Francisca 2012:13).



Women moving towards a safer location.

7.3.5 Forced migration/displacement

Despite the deleterious effects of labour migration on left-behind family members, literature on migration and subsequent utilisation of remittances for household use in Nepal presupposes that the migrant and the household have made a conscious choice to migrate as a livelihood strategy (see more in Sharma and Sharma, 2011). However, there are other cases where the migrants are left with no choice but to migrate to another place to save their lives as in cases of extreme natural or human-made disasters (IOM, 2013).

Due to geology and terrain, Nepal is prone to landslides in the hills and flooding in the plains. Heavy rains/storms trigger landslides in the hills that not only destroy valuable land but also property, structures, resulting in many deaths. In a study (Chaudhary, Jimée and Basyal, 2015) analysing the print media-reported-incidents of landslides over a 42-year period (1971–2013), it was recorded that there were 3,220 landslide events, resulting in 4691 human deaths, 18,902 homes destroyed and nearly 34,126 damaged, and almost 22,576 hectares of arable land was lost. This enumeration of landslides and resultant loss does not reflect the total loss as reporting was not widespread in the early days of print media in Nepal.

Similarly, flooding has been a regular phenomenon in the hills and plains, with devastating consequences in terms of lives lost, property damaged, and land loss. For example, in July 1993, due to floods related to extreme rains and cloudbursts in central Nepal, more than 500,000 people were affected, with 1,336 deaths, 85,451 families affected, more than 39,000 houses destroyed/damaged, 57,013 hectares of land lost, and damage to infrastructure like roads, bridges, dams and irrigation canals (MoHA and DPNep-Nepal, 2011). In another flood of 2008 in the Koshi River in the east, the river burst through an embankment at the Koshi dam, resulting in 109,817 people affected with 18,238 households and 1,314 hectares of land lost (MoHA and DPNep-Nepal, 2011). About

65,000 people were displaced in Nepal and another three million in Bihar, India (NCVST, 2009). The flood also cut off transport and electricity to the eastern part of the country for months. Though the loss from floods can be predicted sometimes days in advance, the same cannot be said of earthquakes.

Another extreme case of natural hazards are the earthquakes, which in Nepal are recurring phenomena and the whole country is vulnerable to these seismic events. The 1934 Nepal-Bihar Earthquake is one of the most devastating earthquakes to strike Nepal in recorded memory besides the 2015 Gorkha Earthquake. The former resulted in about 16,000 deaths in Nepal and India. The next major earthquake to hit Nepal was the 1988 Udayapur Earthquake that left more than 460,000 homeless and caused extensive damage to infrastructure such as roads, bridges, public buildings in addition to private property in eastern Nepal where its epicentre lay (MoHA and DPNep-Nepal, 2011). The most recent 2015 Gorkha Earthquake is estimated to have damages and losses over NPR 7.5 billion in monetary terms with more than 500,000 houses fully destroyed and around 250,000 partially damaged (NPC, 2015a). A total of 649,815 families were displaced because of the Earthquake and the aftershocks (MoHA and DPNep-Nepal, 2015:18). Rural to urban migration and displacement further escalated during the aftermath of the Earthquake and because of the high risk posed by landslides and floods (MoHA and DPNep-Nepal, 2015).

7.4 LITERATURE ON THE MIGRATION, ENVIRONMENT AND CLIMATE CHANGE NEXUS IN NEPAL

The global discourse on relationship of migration, environment and climate change (MECC) is growing. Gradually, scholars and organisations are recognising the role that migration and remittances play in climate change adaptation and in lowering the climate change and environmental stressors. However, scholars trying to establish this link between migration and climate change have faced challenges (Laczko and Aghazarm, 2009). In the context of Nepal, the number of studies that have looked into the MECC nexus is very scant. One of the reasons for the lack of governmental and non-governmental attention to this could be the lack of scientific literature to establish these linkages clearly.

The paragraph below enumerates and highlights the major arguments established by scientific studies to understand the MECC nexus. Additionally, a few studies on climate change and disasters have, time and again, recorded cases of labour migration, displacement and temporary or permanent migration in search for better livelihood measures. An example of this being: “In essence, in areas of rain-fed agriculture, it is farmers and their families that cope with drought in whatever manner they can. Often this entails extending seasonal migration for work (called *nimek garne*) by leaving earlier and staying out for a longer period’ (Moench and Dixit, 2004:42). Similarly, a case study prepared by ISET-Nepal for the International Centre for Integrated Mountain Development (ICIMOD), based on their study of four eastern and central districts of Nepal to understand the community responses to “too much and too little water”, observed temporary migration for wage labour to various internal and international cities from these areas, particularly after any major crop-destroying disaster (ICIMOD, 2009b:28).

Among others, a number of studies are based on the Chitwan Valley Family Study (CVFS) that analyse the relationship between various environmental degradation proxies and migration. Massey et al. (2010), based on the CVFS, argue that mobility is determined by

perceived decline in agricultural productivity and forest cover and increase in the time required to collect firewood and fodder. Similar observations were made by Shrestha and Bhandari (2007) where families that perceived threat in environmental security, taking time to collect firewood as a proxy, had higher chances of having a labour migrant. Additionally, Bohra-Mishra and Massey's (2011) analysis showed migration being affected by environmental indicators like time required to collect firewood and fodder, agricultural productivity, quality of drinking water, and population density.

Jacquet et al. (2015), conversely, mention that areas with high outmigration, particularly the western region of Nepal, have seen increased vegetation cover, thereby reducing the chances of soil erosion and land degradation. On the part of disaster-led migration, a study by Banerjee et al. (2011) conducted in eastern hills and Tarai of Nepal mentions that chances of migration was higher in communities that are exposed to rapid-onset disasters as compared to the slow-onset ones. A study conducted by Practical Action, an international non-governmental organization (INGO), to understand the disaster-migration nexus suggests that migrants are spending remittances to construct houses, but neither do they consult with the engineers much, nor are they aware about the housing codes suggested by the Government (Manandhar, 2015).

7.5 POLICY REGIME ON CLIMATE CHANGE AND MIGRATION

This section is divided into three parts, where the first talks about climate change and climate change adaptation; the second highlights the existing policies related to migration, and the third tries to delve around the evolution of the periodic plans from the tenth plan (–2007) to the fourteenth plan (2016–2019) looking from the perspectives of climate change and migration separately and jointly. The third section also briefly discusses the change in the MECC nexus after the 2015 Earthquake.

7.5.1 Climate change-related policies

After signing the UNFCCC in 1992 and becoming a Party to the Convention in 1994, Nepal has continuously engaged itself in designing and implementing national and international policies to address climate change or promote adaptation to climate change. Since 1992, Nepal has also participated in and organised a number of national, regional and global conferences – like the International Conference of Mountain Countries on Climate Change in 2012, South Asian Regional Climate Change Conference “from Kathmandu to Copenhagen” in 2009, International Conference on Climate Change Innovation and Resilience for Sustainable Livelihood in 2014, Conference on Community-based Adaptation to Climate Change in 2014, Nansen Initiative South Asia Civil Society Meeting in 2015, United Nations Climate Change Conferences (COPs), to name a few. In the meantime, the Kyoto Protocol was ratified in Nepal in 2005.

At the national level, time and again, various mechanisms have been formed within the government and bureaucracy to better address the effects of climate change and promote low-carbon production efforts, for example: the Climate Change Council in 2009, the Climate Change Management Division in 2010 and a Multi-stakeholder Climate Change Initiatives Coordination Committee in 2011. Similarly, the Constitution of Nepal 2015 and the recent national periodic plans have also given considerable importance to climate change and environmental issues. The drafting of the NAPA, Local Adaptation Plans of

Action (LAPA), Community Level Adaptation Plan (CAPA) and the National Adaptation Plans (NAPs) is a continuation of engaging the people and communities in the design and implementation of climate change adaptation policies and programmes.

Climate Change Policy (CCP) 2011

The CCP was drafted with the objectives of (a) building climate resilience and adaptation; (b) mitigating the adverse effects; (c) promoting clean energy; (d) adopting a low-carbon path; (e) developing capacities in understanding the present and future impacts of climate change; and (f) the implementation of the policies for better living conditions for the people (MoE, 2011a). Among others, it aimed to initiate the community-based local adaptation actions by 2011, preparing for the Clean Development Mechanism by 2012, formulating and implementing the low-carbon economic development strategy by 2014, assessing the impacts of climate change across geographical areas and development sectors by 2013. It also paved the way for the development of national to community-level adaptation plans in line with the international protocols. The CCP acknowledges that climate change has both direct and indirect impacts on the livelihoods and, therefore, the need to create opportunities for better adaptation and resilience. The Policy also considers securing the livelihoods of the individuals who are the victims of water-induced disasters, such as floods, landslides and droughts. However, the CCP does not address migration, displacement or relocation (MoE, 2011a).

Adaptation plans and programmes

As a part of the least developed countries (LDC) work programme of the COP, Nepal formulated the NAPA in 2010, and the LAPA and CAPA are already designed for some areas while in many areas, they are yet to be designed. Similarly, the NAPs process is also underway.

Nepal's NAPA, adopted in 2010, aims to highlight the role of climate change adaptation through disaster preparedness, community resilience, livelihood diversification, and poverty reduction. It acknowledges the importance of mainstreaming climate change adaptation policies in aspects that directly affect the livelihoods of the people, primarily agriculture, water resources, climate induced disasters, urbanization, public health and biodiversity (MoE, 2010b). The NAPA is a major step in an attempt to determine immediate needs in responding to the risks of climate change through participatory means, though it overlooks the possibility of migration and remittances in addressing future adaptation requirements of migrant sending households and origin communities (Banerjee et al., 2011). On the other hand, there is acknowledgement in the NAPA of the negative aspects of migration such as the rising challenges in "the urban planning process" because of rising "climate induced rural-urban migration" (MoE, 2010b:14); rise in the workload of women because of male outmigration (MoE, 2010b:61); and "risks of insecurity and sexual violence against women" during the course of temporary displacement and unmanaged shelters (MoE, 2010b:61). None of the LAPAs and CAPAs formulated until now reflect on migration or the MECC nexus.



A woman showing her go back which is prepared for her travel in case of flood as an adaptation strategy.

The NAPs that are being formulated highlight nine different sectors in relation to climate change. With extensive involvement of the actors from the development sector, including the private, non-government and government, it is understood that the chances of migration as a form of livelihood opportunity and remittances as a medium to enhance the adaptive capacity will be highlighted in the Plan. The nine thematic areas of NAPs are: a) agriculture and food security; b) forest and biodiversity; c) water resource and energy; d) public health; e) climate-induced disasters; f) urban settlement and infrastructure; g) tourism, natural and cultural heritage; h) gender and social inclusion; and i) livelihoods and governance (MoSTE, 2015:7).

7.5.2 DRR plans and policies

The Nepal Disaster Report 2015 acknowledges that the linkages between DRR, poverty, migration, livelihood and internal displacement have not been well established. There was a serious humanitarian crisis for displaced families post-April 2015 Earthquake (MoHA and DPNep-Nepal, 2015). However, the DRR initiative in Nepal is still very nascent. Following the Hyogo Framework of Action (2005–2015) and the Sendai Framework for Disaster Risk Reduction (2015–2030), Nepal has also taken considerable measures towards the drafting and implementing DRR plans and policies (MoHA and DPNep-Nepal, 2015). Nepal is still in the process of drafting a new Disaster Management Act; the bill and policy is still under review. However, the National Strategy for Disaster Risk Management in Nepal (NSDRMN) was approved by the Government in 2009. Subsequently, district level disaster management plans have been formulated under the Local Disaster Risk Management Planning Guideline, 2011 to rank the priority sectors, possible cases of disasters and their management. The National Building Code was formulated in 1993 that has specified the construction, monitoring and evaluation of buildings and structures. A National Disaster Response Plan has also been formulated under the National Disaster Response Framework for effective coordination and implementation of disaster management and preparedness plans. The Nepal Risk Reduction

Consortium was formed in 2009 bringing all the governmental, non-governmental, multilateral and humanitarian agencies together for devising strategies to reducing Nepal's vulnerability to disasters. The NAPA and the LAPA, acknowledge the need for concrete DRR management plan from the national to the local level (MoHA and DPNet-Nepal, 2015).

7.5.3 Migration-related policies

The Ministry of Labour and Employment is responsible for overseeing international labour and migration in Nepal. There are three laws governing outmigration from Nepal, namely: Foreign Employment Act, 2007, Foreign Employment Rules, 2008 and Foreign Employment Policy, 2012. As the names suggest, these policies and regulatory frameworks related to labour migration in Nepal work towards ensuring safe, dignified and decent foreign employment by keeping safety and protection of workers as a topmost priority. All of the policies are focused on the protection of migrant workers but do not make any links with the climate change and environmental regime. Further, Nepal is yet to ratify any international conventions related to the protection of migrant workers. However, Nepal enacted Human Trafficking and Transportation (Control) Act in 2007 and has developed both a national action plan and a national policy on trafficking in women and children. The Act applies to all persons, prohibits multiple forms of trafficking exploitation, and places relatively equal emphasis on prosecution and victim assistance.

Recently, the Ministry of Labour and Employment (MoLE) has integrated climate change element in its unpublished Five Year National Strategic Work Plan for Safer Foreign Employment (2015–2019). The Work Plan aims to devise a specific national strategy to address the nexus between climate change and migration through more research and stakeholder consultations. It has allocated NPR 3.7 million for carrying out the research activities. There are seven specific objectives of the Work Plan: a) identification and promotion of employment opportunities in international market; b) maximisation of benefit of foreign employment through the development of the skilled and competent human resources; c) making overall phases of foreign employment simple, transparent, reliable, organised and safe; d) ensuring the rights of women workers throughout all phases of migration cycle along with the addressing concerns in the labour market; e) ensuring good governance in the foreign employment management; f) promoting collaboration through enhanced regional cooperation; and g) maximum mobilisation of remittances for the human development and productive sector (MoLE, unpublished). The aspect of linking migration and climate change is currently under the sixth objective promoting collaboration through enhanced regional cooperation.

For migration to India, as discussed earlier, there is only the Treaty of Peace and Friendship that was signed between the two governments in 1950. There has been no policy changes to this since then and there is a lot of unregulated movement across the 1,850 kilometres long border (Sharma and Thapa, 2013). However, recently some efforts have been initiated by the governments of the two countries to make required modifications in the Treaty. There are two articles in the Treaty that look into migration, both directly and indirectly. Article Seven says: The Government of India and Nepal agree to grant, on a reciprocal basis, to the nationals of one country in the territories of the other the same privileges in the matter of residence, ownership of property, participation in trade and commerce, movement and other privileges of a similar nature. Article Six says that the national of one country will get national treatment in the other country “with regard to participation in industrial and economic development of such territory....”.

Internationally, Nepal has not been signatory to the major conventions and treaties that protect the rights of the migrant workers or their families. However, Nepal has been a part of the Colombo Process, Dhaka Consultation 2011, Bali Consultation 2005, Manila Consultation 2004, and Colombo Consultation 2003, and through the SAARC Convention in 2015, the member countries have decided to work together for the protection of the rights of their migrant workers, especially of those who are working in the Gulf States.

7.5.4 Periodic plans and the post-disaster needs assessment (PDNA)

The Approach Paper to the most recent periodic plan of Nepal, the Fourteenth Plan (2016/2017-2018/2019), highlights the challenges faced by the agricultural and industrial sectors, forests and water resources (including hydro-electricity), public health and food security, and infrastructure because of climate change and disasters and high rate of outmigration of the youth (NPC, 2016). As a strategy to overcome the challenges posed by climate change, the Approach Paper aims to develop environment-friendly agricultural technologies and irrigation channels, and highlights the importance of climate change adaptation in agriculture, irrigation, food security, capacity building of the communities and diversification of income (NPC, 2016). This also portrays the importance of “reducing emissions from deforestation and forest degradation” (REDD) and disaster risk reduction (DRR) initiatives. The Approach Paper also discusses climate financing for lowering the impacts of climate change both at the national and local level. All of these, the Approach Paper notes, would be crucial for poverty reduction and other developmental interventions (NPC, 2016).

The inclusion of climate change in national periodic plans is not new in Nepal; climate change-responsive economic growth was in fact first introduced in the Ninth Five-Year Plan (1997–2002). The concept was further refined and internalised in the Tenth Five-Year Plan (2002–2007) where there the government took initiatives to start implementing the climate change related international treaties. Migration was introduced in the Tenth Five-Year Plan where the government highlighted the importance of foreign employment in providing employment opportunities to the youth, increasing national savings and subsequently reducing poverty. This period marked the climax of the Maoist insurgency in the country, and since then, the government has adopted measures to promote foreign employment by producing skilled labour (NPC, 2002). Starting off with the Tenth Plan (2002–2007), the Government of Nepal engaged with the “Poverty Reduction Strategy Papers” whereby reflecting various developmental agendas including poverty reduction, livelihood diversification, migration and climate change, among others.

Following the Gorkha Earthquake in 2015, the government conducted a rapid post-disaster needs assessment (PDNA) which highlighted that immediately after the earthquake, because of high male outmigration from the earthquake affected areas, rescue and relief was severely impacted (NPC, 2015b). The report also emphasised the role of temporary migrants in rebuilding and reconstruction efforts. Likewise, the report underlined the possibility of high urban migration and displacement in search of better livelihood options after the earthquake (NPC, 2015b). In this context, the National Reconstruction Authority (NRA) is mooted a guideline to construct environment-friendly-earthquake-resistant houses for the natural disaster-affected households by mainstreaming financial and social remittances into preparedness and adaptation (NPC, 2015b). Current remittance data highlights that the amount is increasing post-earthquake, primarily in an effort to build back (MoF, 2016). This PDNA could be important in strengthening the MECC nexus from the perspective of

DRR and prove to be catalytic in implementing MECC-related policy interventions in the future. IOM and other stakeholders have played an important role in initiating this and linking remittances with other DRR initiatives at the policy level (see IOM, 2013).

7.5.5 Institutional arrangements to address MECC

The two nodal ministries for environment and climate change and migration are Ministry of Population and Environment (MoPE) and MoLE. As alluded to earlier, MoPE is focused on mitigation of and adaptation to climate change, while MoLE is more focused on foreign labour employment and other forms of migration. There is no single focal agency to look at the cross-cutting issues of climate change and migration. This is hardly surprising given the fact that government ministries/departments/line agencies in Nepal operate within a narrow set of guidelines that define their roles and responsibilities setting territorial boundaries which are hard to bypass. This should not be held against these disparate agencies as there is neither a mechanism to mainstream MECC issues nor appropriate policy guidelines. It may also be due to the cross-cutting nature of climate change and multi-faceted character of migration that it is not possible for any single ministry of line agency to take on the task issues arising out of MECC nexus.

Despite the shortcomings, as seen from above, a review of different policies on climate change and migration, the government is sensitive to both aspects of the phenomena, but not the combined or the causal effects of these two. After acknowledging the inevitability and effects of climate change as well as migration as a phenomenon that substantially contributes to society with financial and social remittances, the next logical step would be to recognise the MECC nexus within developmental strategies.

7.5.6 State of implementation, gaps, and ways forward

Since 2010, Nepal has obtained funds for climate change initiatives from both within and outside the UNFCCC regime in areas of adaptation, mitigation, institutional capacity building, education and awareness raising and knowledge management. While Nepal has many good strategies for climate change adaptation and pro-poor migration, implementation and monitoring of many of the policies and strategies still remains a challenge. Further, public awareness about the relationship between climate change adaptation and migration is relatively low in Nepal. This is manifested in the lack of an acknowledgement of the potential of migration and remittances as a means for climate change adaptation in the origin communities.

The role of labour migration and remittances on adaptation, sustainable development, livelihood diversification, community resilience, and in the context of gender issues across these sectors has not been holistically examined. There is a distinct need for a coordinated effort amongst all stakeholders to pursue evidence-based policy engagement policies that encourage and support the investment of financial remittances and use of social remittances such as ideas, customs and practices in the major sectors of poverty reduction and climate change adaptation. Policies must also facilitate access to information on climate change and environmental impacts, financial services and government schemes. For this, the government and INGOs should focus on providing technical guidance to invest in low-risk and low-cost adaptive measures at the District/Village Development Committee (DDC/VDC) levels.

Despite mobilising resources on climate finance, Nepal has limited experience in developing coping strategies and adaptation mechanisms. The investment in and introduction of

science and technology for better climate resilience is lacking in the country. However, some positive efforts of using modern agricultural technologies and consultations with the experts have been made in this regard. There are also a few examples of adopting indigenous knowledge mostly in agriculture such as changes in cropping patterns and choice of crops (Pant, 2011). Other areas such as forestry and livestock have relatively less innovation and practices to deal with climate risks and hazards (Bhusal, 2009).

As already stated, the number of studies conducted to understand the climate change, environmental degradation and migration nexus in Nepal is very scant. As a result, the relationship between climate change, environmental degradation and migration is still very blurred. To effectively understand the MECC nexus, there is a need for a large-scale study to be conducted at the national level. Labour migration in relation to climate change and environmental degradation has not been given a high priority. Considering the well-established fact that Nepal is highly vulnerable to climate change impacts, specific mention of the MECC nexus and ways to address these concerns holistically needs to be included by developing implementable strategies in promoting community-based adaptation through integrated management of agriculture, water, forest and biodiversity sectors.

7.6 RESULTS FROM THE PRIMARY DATA COLLECTION – NEPAL

As mentioned above, the empirical study adopted a mixed-method research design. The major objectives of the research were to find out people's perceptions of climate change and environmental degradation and their links to migration in Nepal and to understand in detail about the factors that influence migration in the country. With the findings from the study, this research report attempts to establish the link between climate change and migration using a livelihoods approach. The key argument of the report is that people may not always directly perceive climate change as a factor for affecting migration, however, various proxies of climate change may indicate the relationship between these processes.

7.6.1 Description of the study area

Darchula is the north-western most district of Nepal. The district, located in the high mountainous region, is bordered by India in the west and China in the north. The study was conducted in five VDCs of Darchula district, namely: Bhagawati, Dattu, Uku, Lali and Shankarpur.

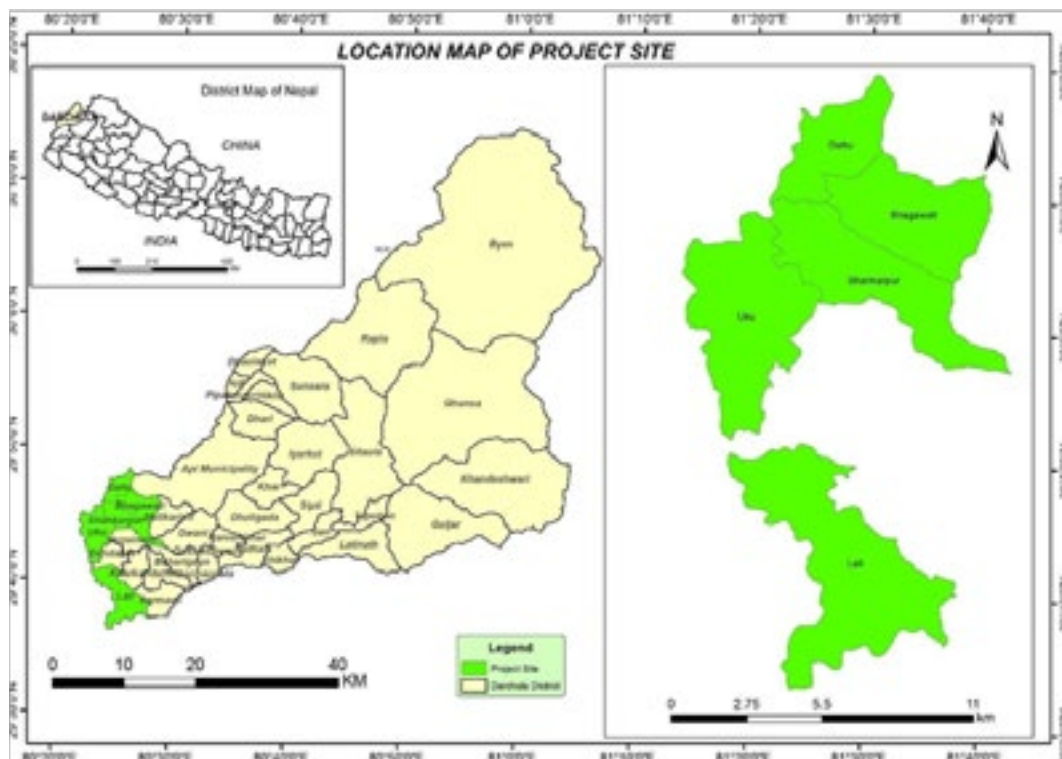
Table 29: Socioeconomic and demographic characteristics of Darchula

No.	Characteristics	Numbers
1	Total area (in square kilometres)	3276.28
2	Population density	57
3	Total households	24,618
4	Total population	132,484
5	Total females	62,864
6	Total males	69,620
7	Sex ratio	91.3
8	Average household size	5.41
9	Economically active population	59,530 (44% of the total)
10	Per capita income	USD 627 per annum
11	Malnourishment rate (under 5)	47.8%

Source: CBS, 2011.

The study district was selected based on the “climate change vulnerability ranking criteria” developed by the Ministry of Population and Environment (figure below), complex topography, low development interventions, increasing outmigration, and in consultation with the Project Steering Committee. Mapping of recent natural hazards in the Darchula district shows that it is highly prone to cloud outbursts and is susceptible to intense floods and landslides (MoE, 2010a). In June 2013, the district witnessed one of the worst natural disasters – floods and landslides – that resulted in heavy loss of lives and property (MoHA and DPNet-Nepal, 2015).

Figure 68: Map of the study area



Recently, the Government of Nepal has identified Darchula district as one of the most disaster-prone districts of Nepal (DDMP, 2014). Similarly, a study conducted in 2013 in Darchula recommends the government to carry out a study to identify potential hazards due to heavy landslides and debris flows and develop a long-term master plan to reduce water-induced disasters in the district (Paudel, Regmee and Upadhyay, 2013:14–5).

Table 30: Climate change vulnerability ranking of Darchula

Climate Change Vulnerability Index, 2010, Darchula	
Rainfall/Temperature	Very Low
Ecological	Low
Landslide	High
Flood	Very Low
Drought	Moderate
GLOF	Very Low
Overall	Moderate

Source: Climate Change Vulnerability Mapping for Nepal, MoE, 2010.

Further, the District Disaster Management Plan (DDMP) for Darchula provides a detailed review of the district and VDC-level assessment of the changes in environmental hazards as per the monthly calendar of the region. The table below highlights how a few of the indicators have shifted their yearly occurrence.

Table 31: Monthly seasonal calendar of climate change proxies

Monthly Seasonal Calendar of Climate Change Proxies													
Disasters		Baishak (April-May)	Jestha (May-June)	Asar (June-July)	Saun (July- August)	Bhadau (August- September)	Asoj (September- October)	Kartik (October- November)	Mangsir (November- December)	Push (December- January)	Magh (January- February)	Falgun (February- March)	Chait (March- April)
Floods	Earlier												
	2014												
Landslides	Earlier												
	2014												
Hailstorm	Earlier												
	2014												
Strong wind and storm	Earlier												
	2014												
Forest-fire	Earlier												
	2014												
Snowfall	Earlier												
	2014												
Crop diseases	Earlier												
	2014												
Rainfall	Earlier												
	2014												
Heat	Earlier												
	2014												
Cold	Earlier												
	2014												

Source: MoFALD, 2014.

Similarly, the table below suggests the disaster ranking of the five selected study areas.

Table 32: VDC level disaster ranking

VDC Level Disaster Ranking					
VDC	First	Second	Third	Fourth	Fifth
Bhagawati	Floods	Landslides	Hailstorm	Lightening	Forest-fire
Dattu	Floods	Landslides	Strong wind and storm	Hailstorm	Forest-fire
Lali	Floods	Landslides	Hailstorm	Forest-fire	Drought
Shankarpur	Landslides	Floods	Crop diseases	Strong wind and storm	Drought
Uku	Floods	Landslides	Problems cause by wild animals	Epidemic	Strong wind and storm

Source: MoFALD, 2014.

Further, the demographic changes in the five study VDCs of Bhagawati, Dattu, Lali, Shankarpur, and Uku show an interesting trend. As per the last census (2011), all these five VDCs have witnessed decreasing population growth rates over the last ten years (from 2001 to 2011). Although Darchula district had an annual growth rate of 0.94, all these VDCs have witnessed negative population growth rate, indicating the trend of, among others, out-migration from these areas to other urban settlements or international migration. Conversely, with the exceptions of Lali and Uku, the other three VDCs have seen increased female population but decreasing male population in the span of ten years. Thus, there has been notable decline in sex ratio (number of males per 100 females). Between 2001 and 2011, in all these VDCs, sex ratio has declined quite remarkably (CBS, 2014).

Table 33: Population trend in the study VDCs

	VDC	2001 census				2011 census				Growth rate
		Total pop	Male	Female	Sex ratio	Total pop	Male	Female	Sex ratio	
1.	Bhagawati	3,036	1,490	1,546	96	3,018	1,389	1,629	85	-0.06%
2.	Dattu	2,231	1,029	1,202	86	2,186	946	1,240	76	-0.20%
3.	Lali	3,088	1,437	1,651	87	2,808	1,273	1,535	83	-0.91%
4.	Shankarpur	2,996	1,454	1,542	94	2,981	1,411	1,570	90	-0.05%
5.	Uku	3,931	1,877	2,054	91	3,572	1,626	1,946	84	-0.91%
	Total	15,282	7287	7995	91	14,565	6645	7920	84	-0.47%

Source: CBS, 2014.

The decline in sex ratio is also corroborated by the proportion of absentee population from these VDCs. In the census, absentee population is the count of only those who have gone away from their homes to a different country for various purposes; internal migrants are not counted here. Over the years, youths, especially males, have been migrating in search of employment to various parts in the southern districts of Nepal and in the bordering towns of India. In the census year, around eight per cent of the total population was recorded as absent. Hence, the high rate of male absentee population has contributed towards the decline in population as well as in sex ratio of the study locations.

Table 34: Absentee population from the study VDCs

	Name of VDCs	Total HHs in VDCs	Absentee				Percentage Absent	
			Total HHs	Total Population	Males	Females	HHs	Individuals
1.	Bhagawati	594	149	226	198	28	25.08	7.49
2.	Dattu	458	121	176	158	18	26.42	8.05
3.	Lali	552	169	266	228	38	30.62	9.47
4.	Shankarpur	600	161	245	213	32	26.83	8.22
5.	Uku	721	193	294	261	33	26.77	8.23
Total		2,925	793	1,207	1,058	149	27.11	8.29

Source: CBS, 2014.

The MoPE and the MoLE jointly urged IOM to undertake the study in Darchula to obtain diverse MECC perspectives from less researched mountainous districts. According to the 2014/2015 status report published by the MoLE, overseas labour migration in Darchula district has increased from 198 males and no females going abroad in 2008/2009 to 1,163 males and 11 females people migrating for foreign employment by the end of 2014/2015 (MoLE, 2016).

Similarly, the number of passports issued/recommendations for passport given by the District Administration Office (DAO) of Darchula also suggests that the number of international migrants (which includes to all countries except India) is also on the rise. Between 2006 and 2015, the passport issuance/recommendation at the DAO Darchula has increased more than five times.

7.6.2 Demographic and socioeconomic profile of the study population

This section provide details on the demographic and key socioeconomic characteristics of the study population, primarily focusing on age, gender, household size and status, education and primary occupation, levels of income and expenditure of the respondent households. The table below presents a snapshot of the details of the sampled households/ respondents. The detailed analysis will be presented in the sections that follow.

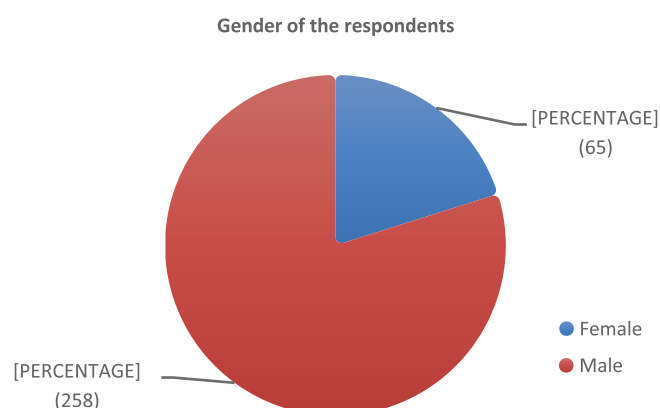
Table 35: Brief overview of the household characteristics

Descriptive Statistics					
Variables	N	Min.	Max.	Mean	Standard Deviation
Age of the respondent	323	18	84	43.99	14.63
Household size	321	3	30	7.84	3.55
Number of Male Household Members	321	1	15	4.07	1.1
Number of Female Household Members	323	0	15	3.76	2.1
Number of income generating household members	312	1	4	1.35	0.51
Monthly Household Income (NPR)	320	1,000	50,000	12,553.13	7,867.36
Monthly Household Income for Migrant HH (NPR)	129	1,000	50,000	12,627.91	8,461.37
Monthly Household Income for Non-Migrant HH (NPR)	130	1,000	50,000	12,311.54	8,326.49
Monthly Household Expenditure (NPR)	315	1,000	52,000	12,441.27	8,211.22
Monthly Household Expenditure for Migrant HH (NPR)	187	1,000	52,000	12,459.89	8,283.27
Monthly Household Expenditure for Non-Migrant HH (NPR)	190	1,000	40,000	12,718.42	7,555.15
Number of Male Migrants in Household	131	1	10	1.63	1.047
Number of Female Migrants in Household	30	0	9	1.9	1.605
Total Land Size (in ropani)	299	1	100	15.24	14.1
Total Land Size for Migrant HH (in ropani)	122	1	100	17.15	17.25
Total Land Size for Non-Migrant HH (in ropani)	177	1	50	13.92	11.3

Source: IOM Field Survey, 2015.

Gender of the respondents

Of the total 323 completed surveys, a little more than 20 per cent of the respondents were female while the rest 80 per cent respondents were males.

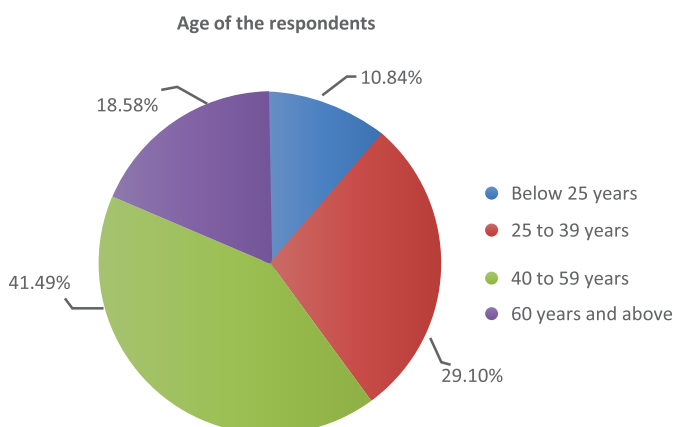
Figure 69: Gender of the respondents

Source: IOM Field Survey, 2015.

Age of the respondents

The mean age of the respondents was around 44 years. Most of the respondents in the survey were between 40–59 years old, followed by individuals belonging to the age category from 25–39 years. Youth, below 25 years, were the least represented as respondents in the survey. There could be two possible reasons for this: one, a high rate of youth mobility outside their homes for economic/non-economic purposes, and two, it is less likely for youths to be the head of the households, who were the respondents for this survey.

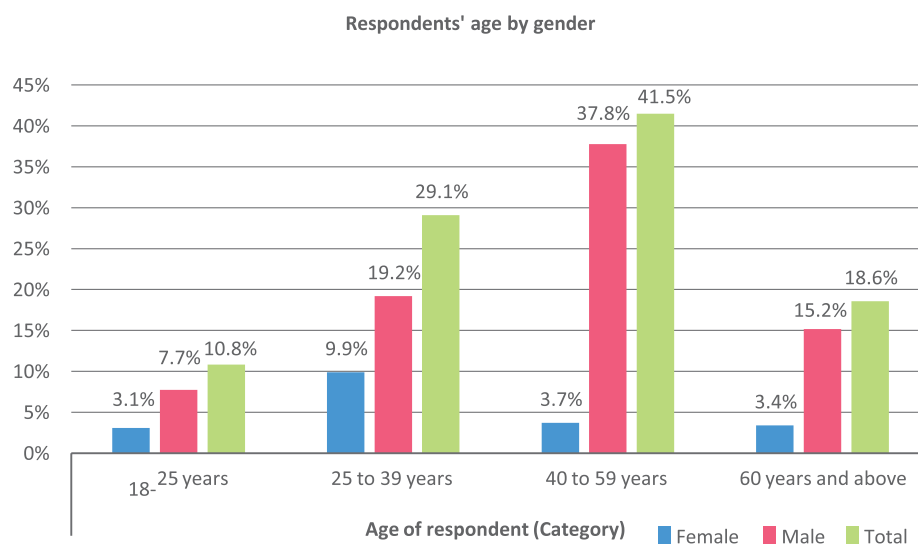
Figure 70: Age of the respondents



Source: IOM Field Survey, 2015.

Similarly, the gender-wise differentiation of the respondents' age shows that most of the female respondents did not belong to the same age category as the males. While most of the male respondents are in the 40–59 years age group, in the case of female respondents, most are in the 25–39 years age group.

Figure 71: Respondents' age by gender

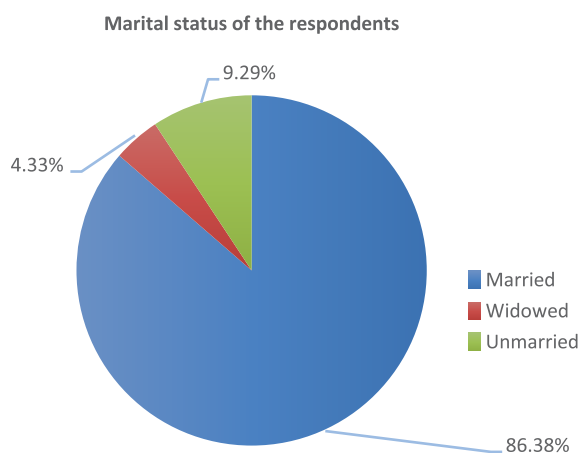


Source: IOM Field Survey, 2015.

Marital status of the respondents

The overwhelming majority (more than 86%) of the respondents were found to be married. Conversely, none of the respondent reported being divorced or separated.

Figure 72: Marital status of the respondents



Source: IOM Field Survey, 2015.

Gender-wise, on the one hand, the rate of widowhood for males is lower. On the other hand, the number of unmarried women respondents in the survey is also quite low. The data collected also indicates that most of the women get married by the age of 25 years.

Table 36: Marital status of the respondents by age and gender (in percentage)

			Marital status of the respondent			
			Unmarried	Married	Widowed	Total
Age of respondent (Category)	18 to 25 years	Female	1.5%	1.5%	0.0%	3.1%
		Male	5.3%	2.5%	0.0%	7.7%
		Total	6.8%	4.0%	0.0%	10.8%
	25 to 39 years	Female	0.3%	9.6%	0.0%	9.9%
		Male	0.3%	18.9%	0.0%	19.2%
		Total	0.6%	28.5%	0.0%	29.1%
	40 to 59 years	Female	0.0%	3.4%	0.3%	3.7%
		Male	0.6%	37.2%	0.0%	37.8%
		Total	0.6%	40.6%	0.3%	41.5%
	60 years and above	Female	0.3%	0.6%	2.5%	3.4%
		Male	0.9%	12.7%	1.5%	15.2%
		Total	1.2%	13.3%	4.0%	18.6%
	Total	9.3%	86.4%	4.3%	100.0%	

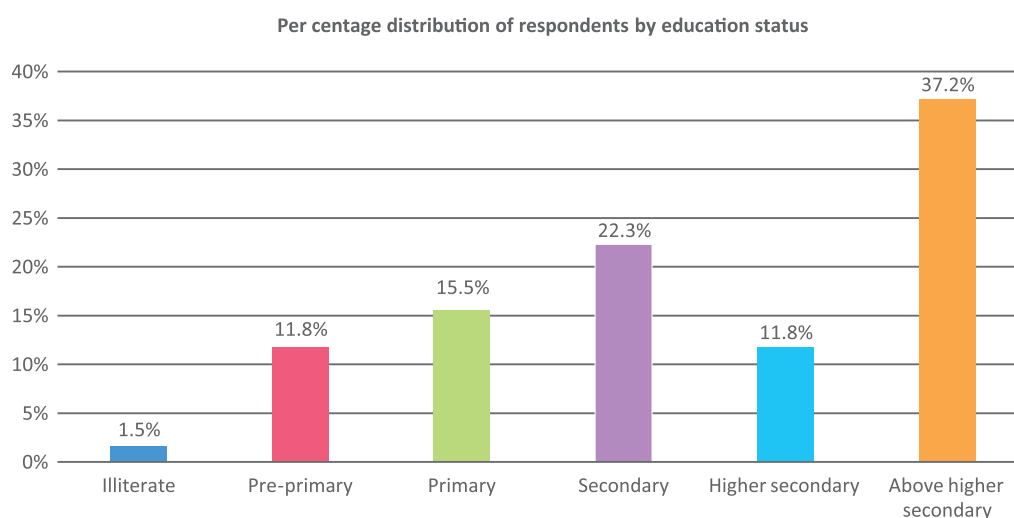
Source: IOM Field Survey, 2015.

Education status of the respondents

Most of the respondents were found to have completed their higher secondary education. One of the main reasons for this, as explained by a key informant from Dattu, was the easy accessibility of colleges in India across the border. The interviewee mentioned:

The literacy rate here is very high because the border is quite close from here. Even I studied in India when the secondary school was not here earlier. The schools [in India] were closer and cheaper. But now, you can find many schools here as well.

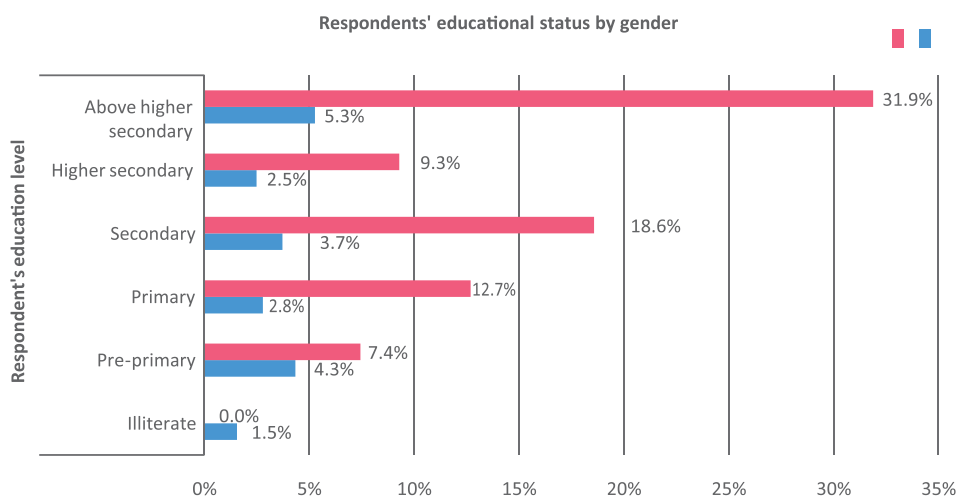
Figure 73: Educational status of the respondents



Source: IOM Field Survey, 2015.

Gender-wise, the figure below clearly shows that the male respondents are more educated compared to their female counterparts. Only 5.3 per cent of female respondents have education status above higher secondary school compared to nearly 32 per cent of males. While there are no illiterate male respondents in the sample, all the 1.5 per cent of the illiterate respondents are women.

Figure 74: Educational status of the respondents by gender

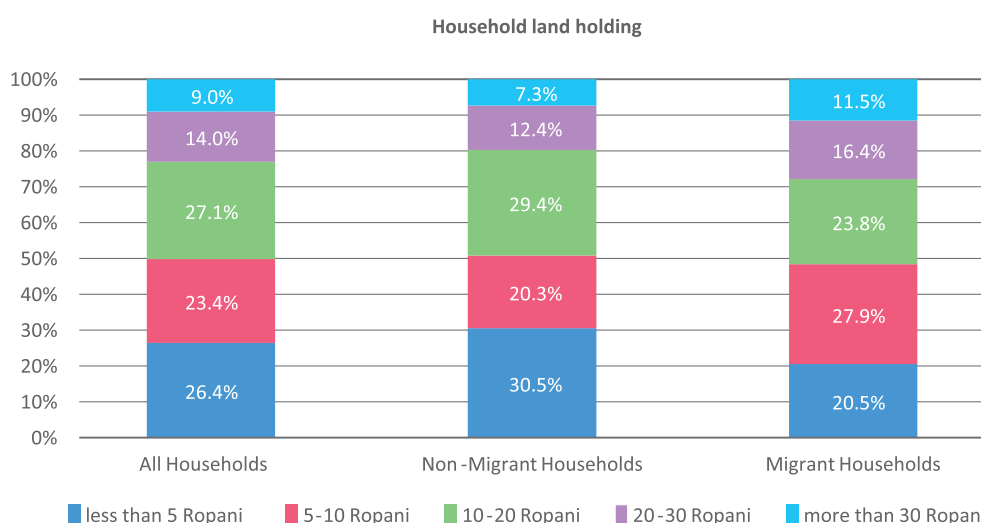


Source: IOM Field Survey, 2015.

Landholdings of the households

More than a quarter of the households owned less than five ropanis of land; however, this drops down to around one-fifth among migrant households (132 households). But migrant households have larger plots of landholding (mean value for migrant households is 17.15 ropanis while the same for the non-migrant households [191 households] is 13.92), which might be due to two reasons. First, that it is indeed the wealthy who can afford to migrate to cities for education, health, and employment opportunities (Figure 13). Second, the migrant families could have bought additional land from the remittances.

Figure 75: Households' land size by migration history



Source: IOM Field Survey, 2015.

Table 37: Land size by history of migration

	Frequency	Min	Max	Mean	Std. Dev.
Total Land Size (in ropani)	299	1	100	15.24	14.095
Total Land Size for Migrant HH (in ropani)	122	1	100	17.15	17.245
Total Land Size for Non-Migrant HH (in ropani)	177	1	50	13.92	11.298

Source: IOM Field Survey, 2015.

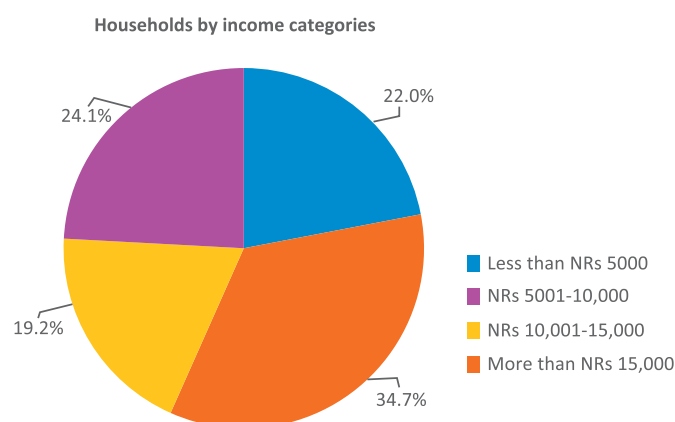
Household's source of income

The mean monthly income for the surveyed households was slightly more than this category, at NPR 12,553.13 (USD 117.03). However, the figure below shows that more than one-third of the surveyed households fall in the income category of NPR 5,001 to 10,000 (about USD 47 to 94) per month. There is a startling wealth gap between the richer and poorer categories of households whereby, the minimum monthly income was NPR 1,000 and the maximum was NPR 50,000. The wealth ranking of the households is important also because economic class is directly linked to mobility. One of the participants of the

FGD in Shankarpur said:

It is the well-off who migrate to the Tarai more than those who come from low socioeconomic background. It does not make sense for the people to sell the land here and buy land in the Tarai because the land prices there is very high.

Figure 76: Sampled households by income categories

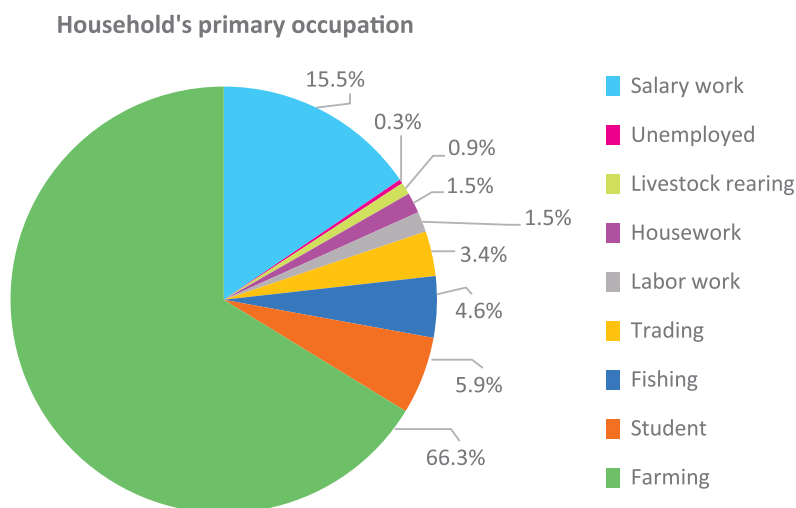


Source: IOM Field Survey, 2015.

Primary occupation of the household

Around two-thirds of the sampled households were found to be heavily dependent on farming. Apart from farming, salaried work in various government, non-government jobs and the private sector was the primary occupation. It should be noted that except for a few tracts of irrigated land, the majority of agricultural land in the study area is rain-fed, which is particularly badly affected by erratic rainfall and droughts. This shows a high dependence on natural resources, thereby increasing their vulnerability.

Figure 77: Primary occupation of the sampled households



Source: IOM Field Survey, 2015.

Household's migration history and primary occupation

The migration experience of the households shows that the two category of households have some key notable differences. While three-fourth of the total migrant households (132) considered farming as their key occupation, the same for the non-migrant households (191) was less than two-thirds. Interestingly, three times more non-migrant households practice trading as their primary occupation compared to the migrant households. The table also shows that non-migrant households have access to more diversified occupations compared to the migrant households. Therefore, it can be surmised that migrant households have less diverse livelihoods and are more dependent on natural resources.

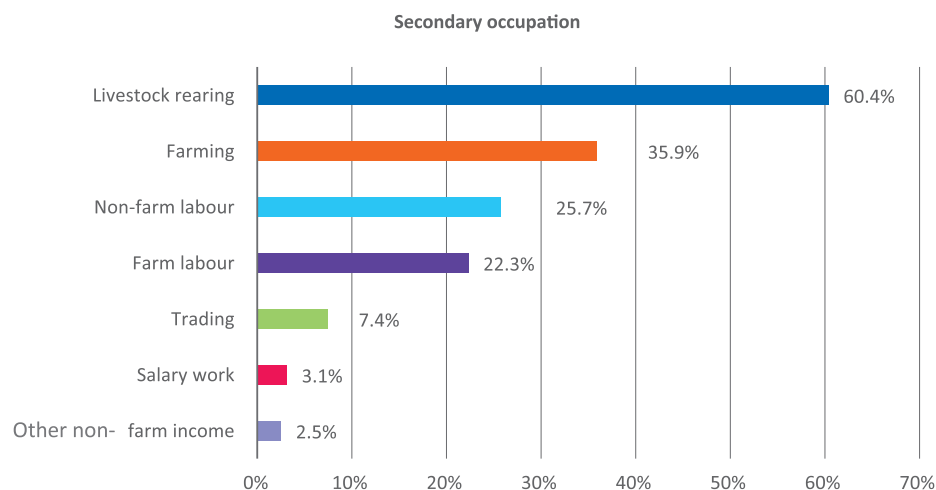
Table 38: Primary occupation of the sampled household by their migration history

Details	Non-Migrant	Migrant	Total
Farming	60.2%	75.0%	66.25%
Fishing	5.8%	3.0%	4.64%
Housework	1.6%	1.5%	1.55%
Labour work	2.6%	0.1%	1.55%
Livestock rearing	1.0%	0.8%	0.93%
Salary work (GO/NGO/Private Sector)	16.8%	13.6%	15.48%
Student	6.8%	4.5%	5.88%
Trading	4.7%	1.5%	3.41%
Unemployed	0.5%	0.0%	0.31%
Total	100%	100%	100%

Source: IOM Field Survey, 2015.

Secondary occupation

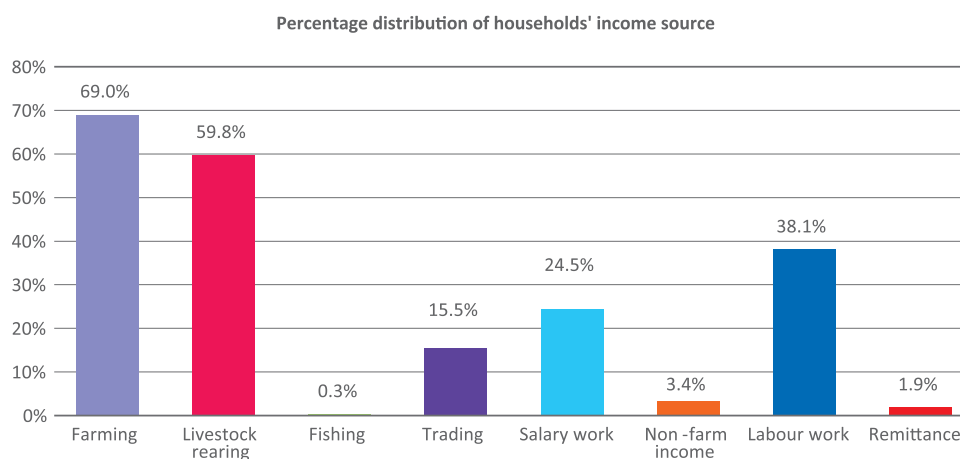
The respondents were allowed to choose multiple secondary occupation sources. Almost two-thirds of all households mentioned livestock rearing, followed by farming (36%), non-farm labour (26%), and farm labour (22%) as their secondary occupation. High involvement of the households in livestock rearing and agriculture as both the primary and secondary occupation, less diversification of occupation and high dependence on natural resources hints that the communities are more vulnerable to any changes in those resources which can be brought about by climate change or human and natural disasters.

Figure 78: Secondary occupation of the sampled households

Source: IOM Field Survey, 2015.

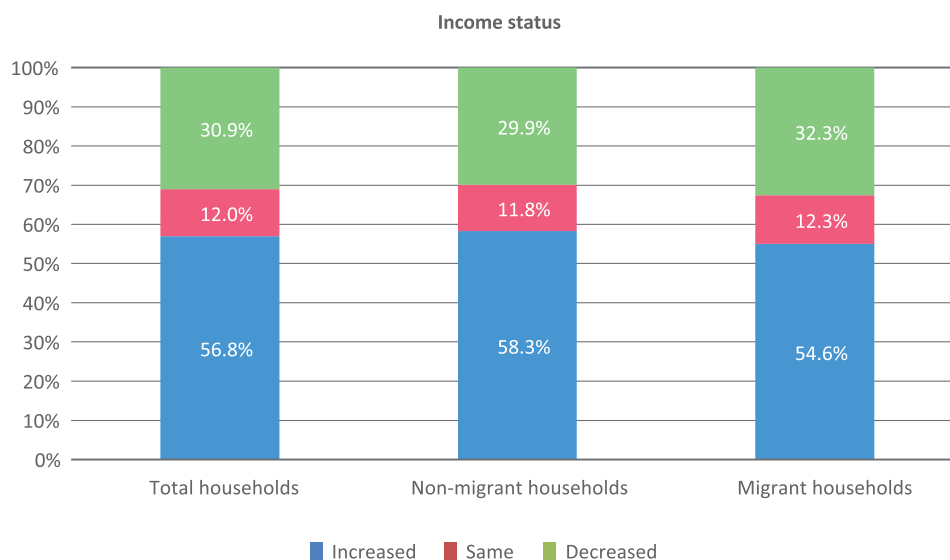
Households' income sources

It is natural for these rural households to engage themselves in multiple activities, primarily agricultural, to generate income. As most of the households are involved in farming and livestock rearing were regarded as income sources by 69 and 60 per cent of the respondents respectively. Apart from this labour work was a source for 38 per cent households and salaried work for 24.5 per cent households. Trading contributed 15.5 per cent to the income of the households. Although labour work was not regarded with much importance as the primary occupation, it was an important aspect of secondary occupation, hence it is serving income to 38 per cent of households (Figure 79).

Figure 79: Sources of income for the sampled households

Source: IOM Field Survey, 2015.

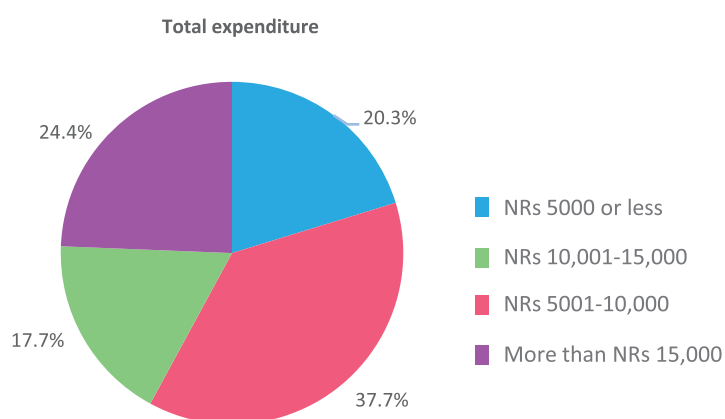
When asked about the change in income over the last 10 years, the majority of the households reported an increase in their income; however, in comparison to total households, fewer migrant households (132) reported an increase in their income and more of them reported a decrease.

Figure 80: Households' income status by migration history

Source: IOM Field Survey, 2015.

Expenditure category

Expenditure-wise, more than one-third of the households fell in the range NPR 5,001 to 10,000 (USD 47 to 94). This is similar to what was seen in household incomes (Figure 14). According to the survey analysis, the mean income, however, was at NPR 12,441.27 (USD 116) and the minimum and maximum monthly expenditure for the sampled households were NPR 1000 and NPR 52,000 (USD 9.32 to 485) respectively.

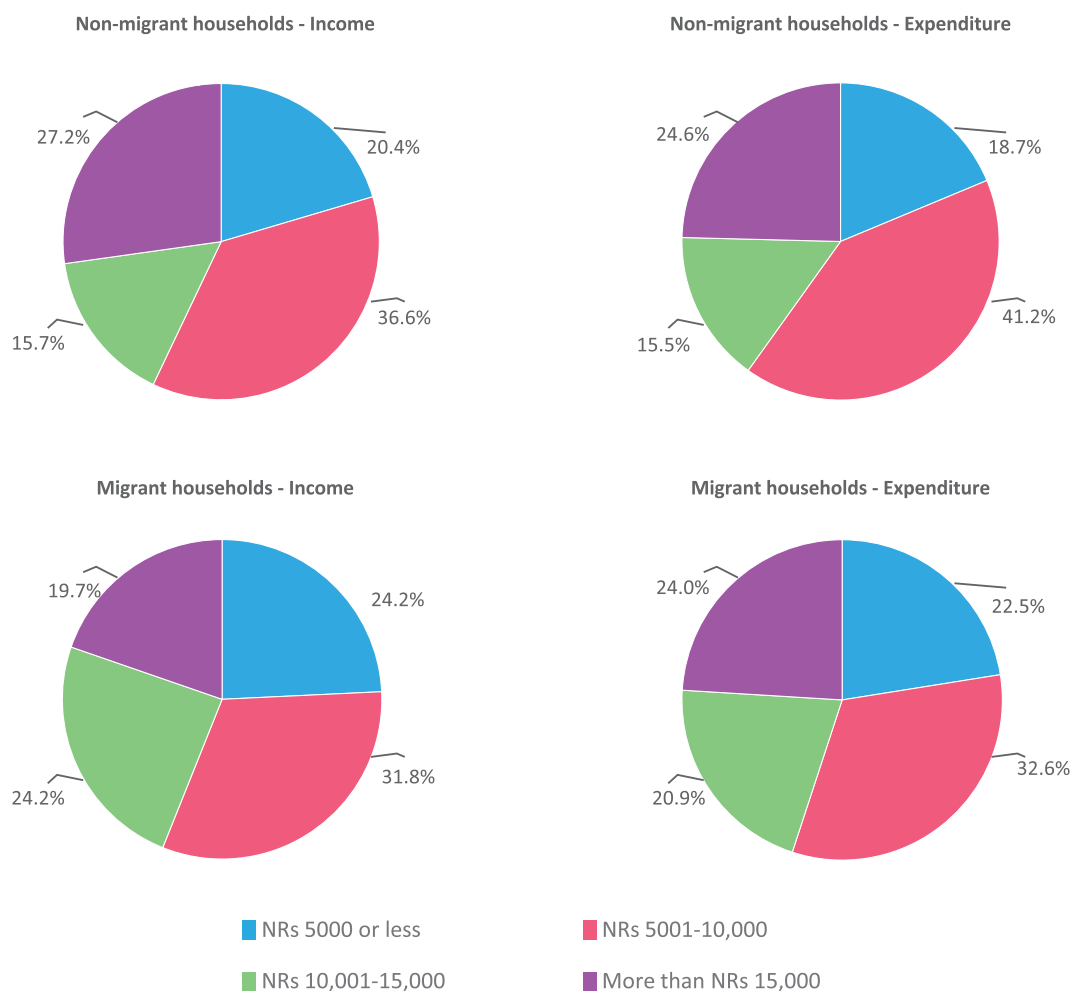
Figure 81: Sampled households by expenditure categories

Source: IOM Field Survey, 2015.

A closer look at the income and expenditure patterns of the migrant (132) and non-migrant (191) households shows similar figures. (However, the amount of expenditure category “more than NPR 15,000” for the non-migrant households in expenditure is less

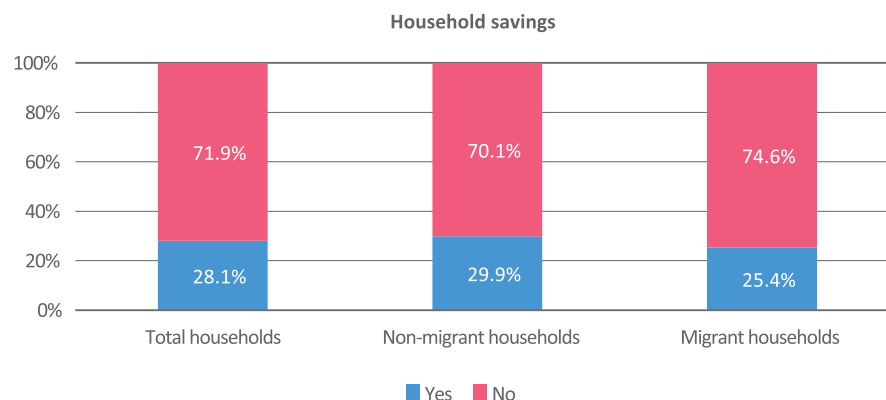
than that of income. On the other hand, for migrant households, expenditure is more than income for the category “more than NPR 15,000”.) It is interesting to note that while the expenditure of non-migrant households tends to stay within their income level, migrant households are spending above their income levels, which implies that their reliance on remittances and patterns of migration is likely to be circular.

Figure 82: Household expenditure categories by migration history



Source: IOM Field Survey, 2015.

Additionally, a lower proportion of migrant households (132) reported having savings compared to the non-migrant households (191) (Figure 83).

Figure 83: Household savings by history of migration

Source: IOM Field Survey, 2015.

7.6.3 State of migration in the study area

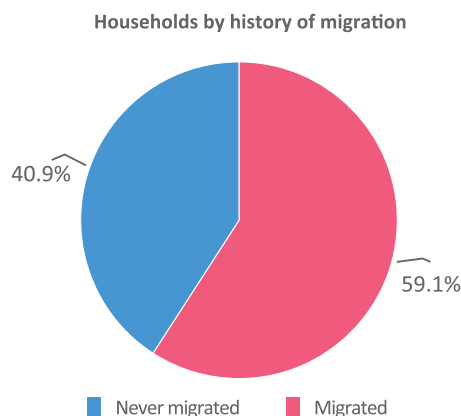
The following points will portray the migration trends in the study areas.

History of migration

Among the total number of households surveyed, about 41 per cent (132 households) had experience of either internal or international migration, while the rest 59 per cent (191 households) had no experience of migration at all. Because all of these sampled villages were very close to India, access to services and mobility to various Indian towns across the border was a common practice. An interviewee from Shankarpur informed:

We buy groceries/basic necessities from India because it is near and cheaper. Although the road access has increased, we still get necessities from India. Also, the quality of education and health services is very bad here. That is one prime reason for migration.

This gives us an idea of the reasons for migration that have occurred and are occurring at the moment. Besides employment (both seasonal and long-term) in India, easy access and availability of services such as health and education have been the main historical reason for migration.

Figure 84: Surveyed households by history of migration

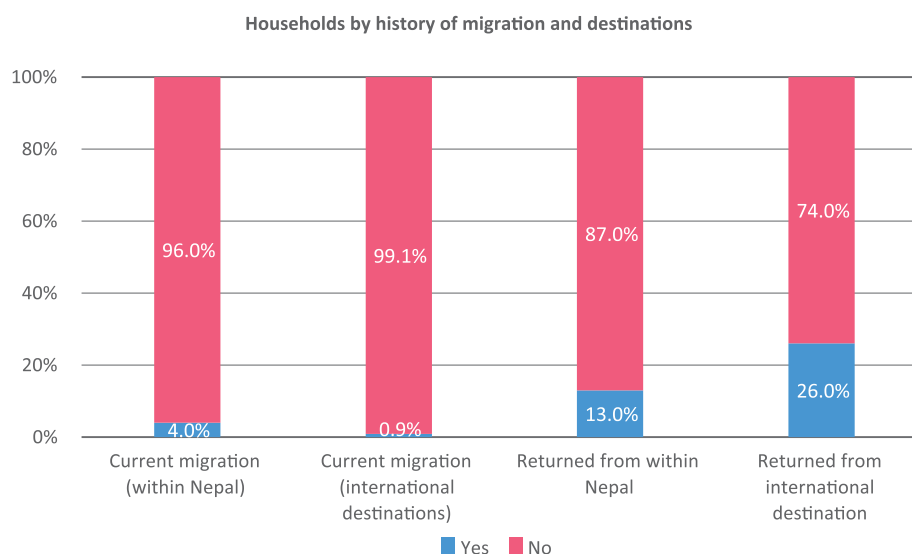
Source: IOM Field Survey, 2015.

Most of the households, as seen in the figure below have returned from international migration. Most of these migrants have returned from labour work in India. For households that reported no experience in migration, this did not necessarily imply lack of mobility. In fact, focus group participants from Uku reported that the households commute to the neighbouring Indian towns for work every morning and come back in the evening. One of the participants of the FGD provided a further rationale for the apparent low level of current rate of migration:

During the agricultural season, the migrants tend to come back to their homes between planting and harvesting. After the harvests have been stored properly, during the off-season, they go to India or the Tarai and work for certain months and come back again before the plantations start.

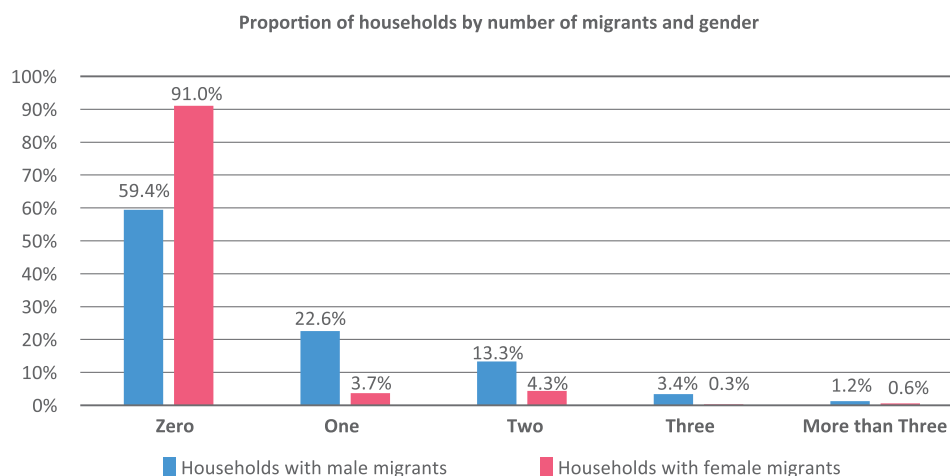
With road connectivity to the Tarai and rest of Nepal, many informants indicated that migration within Nepal has also increased significantly.

Figure 85: Sampled households by migration and destinations



Source: IOM Field Survey, 2015.

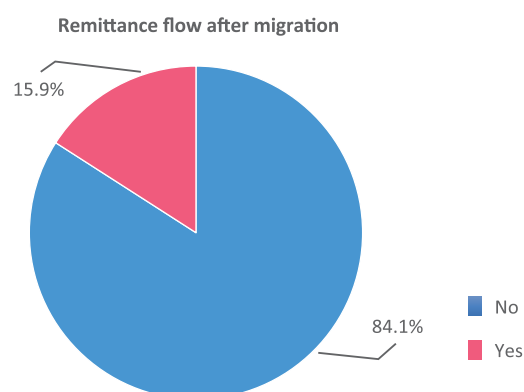
The figure below suggests that women's mobility is highly restricted compared to men. Less than one per cent of the households had three or more than three women migrants; for male migrants, this figure was only slightly higher at 4.6 per cent. This should be understood in the context that most of the surveyed households are non-migrants (as also showed in the figure below) with 59.4 per cent households not having any male migrants and 91 per cent having no female migrants.

Figure 86: Proportion of households by number of migrants and gender

Source: IOM Field Survey, 2015.

Remittances of migrants

Very few households (16%) from among the migrant households (132) mentioned that they received remittances from international or internal destinations after a household member migrates for work. Because this region popularly practices seasonal migration and as there are numerous individuals who commute daily or weekly to India for wages, the instances of remittances is considerably low. The practice among migrants and commuters is to carry money themselves in hand rather than transmitting the money through other channels to their families (see Sharma and Thapa, 2013). This could also be due to the fact that there are only two places (Gokuleshwor and the district headquarters in Darchula) in whole of the district where remittance-receiving facilities are available. Besides being remote and unconnected, there also could be two interrelated reasons for the absence of these facilities. First, very few remittances companies operate in India to transfer money to Nepal and remittance transfers usually occur through the informal channel. Second, since there is low international migration from the area and consequently low remittances, there is not enough incentive for businesses to operate any franchise in the area.

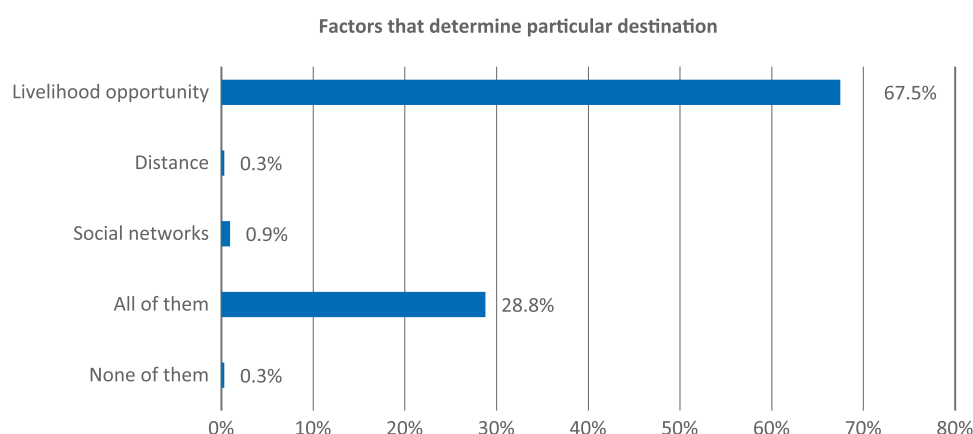
Figure 87: Remittances received by the household

Source: IOM Field Survey, 2015.

7.6.4 Factors that determine the migration route

When asked about the factors that come into play to determine any particular migration destination, a good majority (more than two thirds) of the households mentioned that employment opportunities are the determining factors. Similarly, a little less than one third of the respondents said that in addition to livelihood opportunities, distance of the destinations and their social networks also equally help to decide the migration route. Distance does not seem to be a strong deterrent for migration as one of the participants in Dattu said that people migrate to Mumbai, Chennai, Maharashtra/Pune, and Bangalore, besides the nearby towns and Delhi. These cities are located at least two days of train travel from the village. The other reasons for migrating to India could be that, as explained by FGD participants in Shankarpur, India is near and travel is cheap, and visas are not required. However, they reported a rising trend to migrate to the Gulf countries for labour. The same participant in Dattu also said that migration to these far-away places last longer, up to a “minimum four years”. So farther the migration destination, the time away from family is also longer.

Figure 88: Factors that determine destinations



Source: IOM Field Survey, 2015.

7.6.5 People's perceptions of climate change

This section attempts to capture people's perceptions of climate change and its impact on their livelihoods. The section highlights that most of the proxies of climate change and environmental degradation are closely linked to the sustenance of the households.

People's perceptions of climate change proxies and environmental hazards in their households and livelihoods

Most of the proxies of climate change and environmental degradation, as shown in the figure below, are regarded as affecting the households of the surveyed area. Almost all (98%) of the respondents perceived a rise in temperature. Similarly, an overwhelming proportion of the respondents also witnessed increased frequency of strong winds (88.9%) and groundwater decline (87%). Changes in rainfall patterns, which is an important factor for rain-fed agricultural lands, was experienced by 61 per cent of the respondents. Similarly, floods, landslides, scarcity of freshwater, landslides, and heat waves were also experienced by a considerable number of respondents.

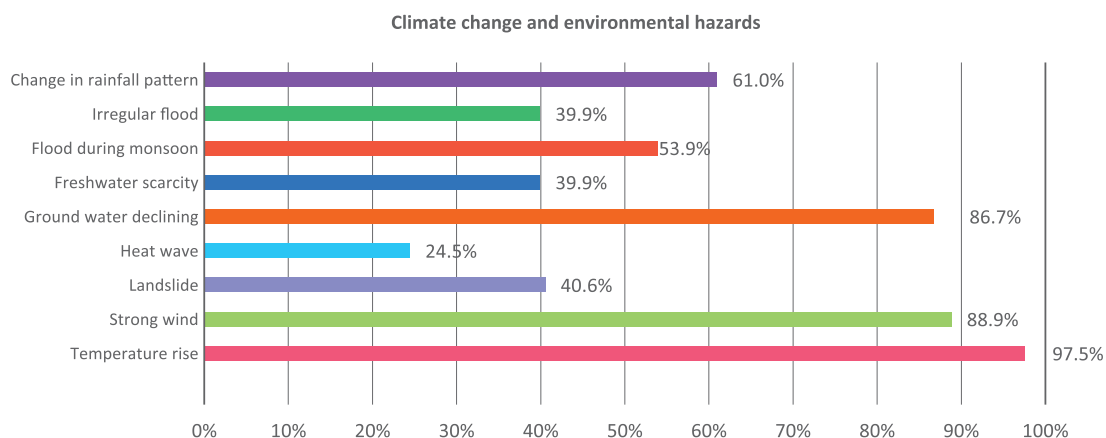
One of the FGD participants in Dattu, which was also noticed by others in Uku, said:

It should be hot now as in Tarai, but mornings and evenings are cooler and we need a quilt at night. It used to be hot in the mornings and there would be rain in the evening.

On reflecting about the devastating June 2013 floods in the Mahakali River due to a powerful cloudburst in the catchment area that swept away land, houses and agricultural fields causing loss of human lives, livestock and properties, one participants of FGD in Dattu said:

We could not imagine that the Mahakali [River] would cause so much devastation.

Figure 89: People's perception of climate change proxies and environmental hazards in their livelihoods



Source: IOM Field Survey, 2015.

Impact of climate change and environmental degradation on livelihoods

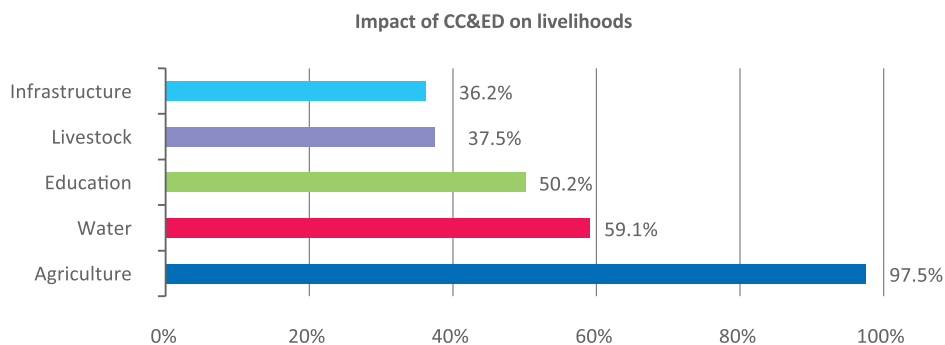
To establish a linkage between the impact of climate change and local livelihoods, the respondents were asked if they had perceived the climate change proxies and environmental degradation directly impacting them. Almost all (97.5%) of the respondents informed that the climate change and environmental degradation have been affecting their agricultural practices. As suggested in Figure 15, an overwhelming majority of the sampled households are dependent on agriculture for their sustenance. The effects of climate change and environmental degradation on agriculture, water sources, education, livestock and infrastructure have, therefore, made the population look for alternatives. This year and last year has been particularly bad for agriculture with erratic rainfall. One of the participants of FGD in Dattu said:

It hasn't rained since August last year. And last year, we could not even plough the land in some places.

Another informant during a KII said:

The fields planted with rice last year have remained fallow this year.

Figure 90: People's perception of climate change proxies and environmental hazards in their livelihoods

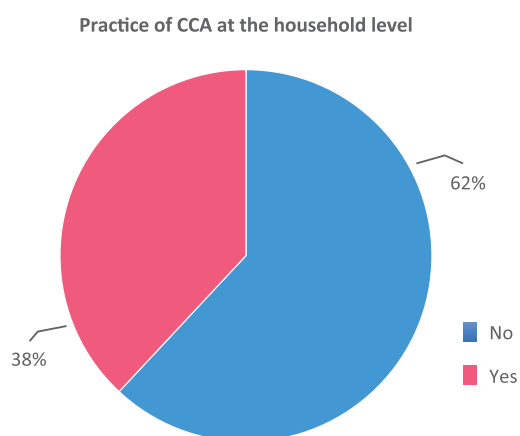


Source: IOM Field Survey, 2015.

7.6.6 Climate change adaptation

As seen in the earlier sections, climate change and environmental degradation have impacted the livelihoods of the study sample, but as seen in the figure below, not everyone is practicing adaptation strategies. There could be various factors like lack of information and resources that inhibit households to adopt adaptation measures. Only 38 per cent of the households of the study sample had adopted some sort of adaptation measures.

Figure 91: Practice of climate change adaptation at the household level



Source: IOM Field Survey, 2015.

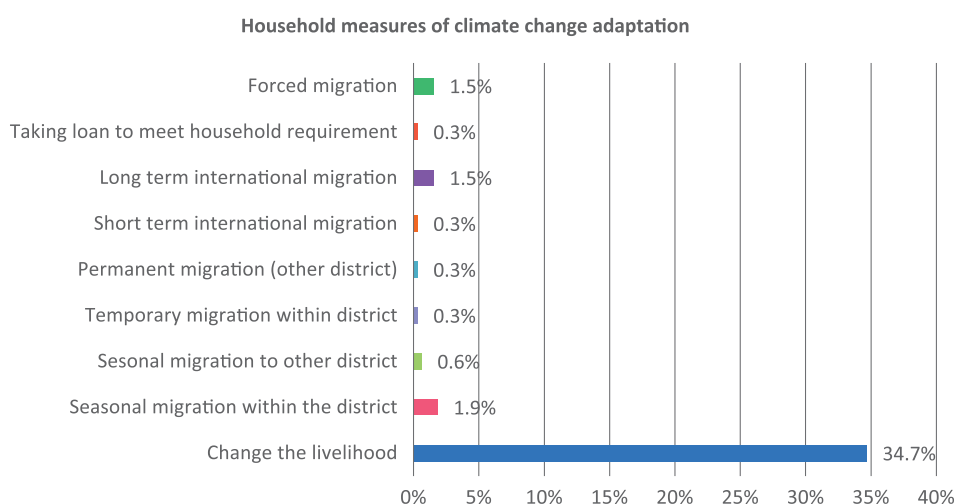
From among the list of adaptation measures that the study questionnaire presented to the respondents, with a focus on climate change, change in livelihoods was the most practiced strategy (35%). The data, however, shows a disconnect between climate change, environmental degradation and migration as an adaptation strategy, as the respondents earlier stated that it is only the wealthy who can migrate in the face of unfavourable

situations. This shows the marginal but critical nature of agriculture in the lives of the people that is susceptible to abrupt changes in rainfall patterns. This implies that despite changes in the regularity of the monsoon, there is not even an option to switch to another crop that might be drought-tolerant. For various underprivileged social groups and families belonging to the lower socioeconomic strata, migration in extreme situations might still be difficult because of various economic and social reasons. This is compounded by the social relations of landholding and farming where sharecropping is practiced by the Dalits. One FGD participant in Uku said:

There are some large landholders but also many families without land among Haliyas [former bonded labourers who ploughed the land]. Their share does not even amount to subsistence level.

Therefore, these marginal farmers have no option but to change their livelihood from farming to other forms of livelihood, with migration for labour being the likeliest option.

Figure 92: Measures adopted by the surveyed households to adapt against climate change



Source: IOM Field Survey, 2015.

However, during one of the interviews, a key informant mentioned:

Migration per se contributes to adaptation. Yes, it has implications at the household level. Flow of remittance is mostly on building houses and not in increasing household-level adaptive capacity. Most of the remittance-receiving households do not have any plan to use remittance in building their own adaptive capacity and hence reduce vulnerability.

7.6.7 Perception of the impact of climate change and environmental degradation on migration

When the respondents were asked if climate change proxies or environmental degradation is affecting their migration decision, no significant answers were received. Only riverine flood, as perceived by 3.4 per cent of the respondents, was believed to trigger migration. Although there is no clear link between climate change, environmental degradation and migration, income earned through labour migration to India could help offset the challenges faced by climate change. During an interview, a respondent informed:

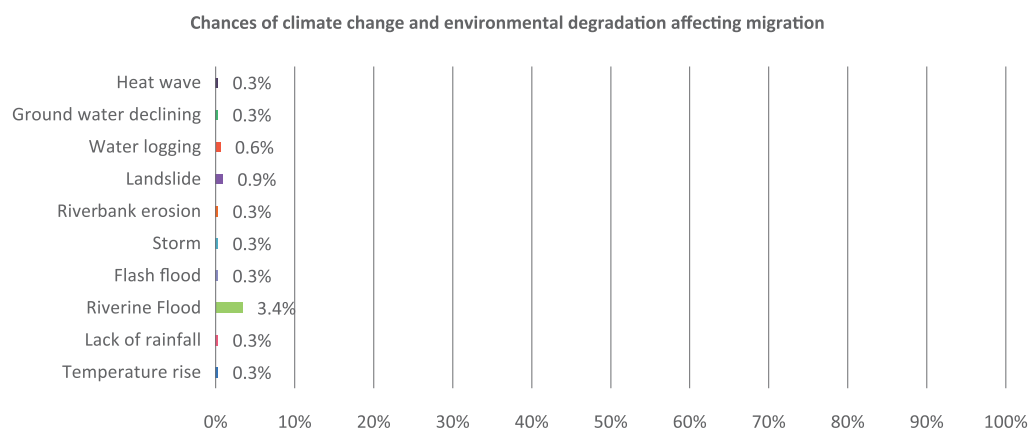
The case of dry spell is very intense this year. This is not a yearly pattern but a regular one. As per my knowledge, there hasn't been a case of migration (in the form of displacement) because of dry spells or food insecurity. But labour migration to India is a regular practice. People go to India, earn, buy the daily necessities and run their livelihoods.

This goes on to underscore the importance of migration (to India) in the livelihood options for the people.

Similarly, a key informant who conducts research on climate change and migration and is based at an INGO in Kathmandu mentioned:

Climate change does not affect mobility but it gets influenced through intermediaries. [For example:] when floods increase, it affects households which could respond to these stressors in many ways. For poorer households where migration is a coping strategy, more stressors coming from slow-onset climate impacts could mean a greater reliance on migration to cope with and adapt to change. Although migration is the most appropriate strategy, its associated costs and social networks do not allow them to do so. Hence, it is difficult to attribute migration to a particular environmental factor, which has been well accepted by scientists. There are multiple factors and intervening challenges which depend on individual structures.

Figure 93: Probability of CC and ED affecting migration decisions



Source: IOM Field Survey, 2015.

7.6.8 Non-climatic factors triggering migration

On the flip side, when the respondents were asked if other non-climatic factors affect migration, 97.5 per cent of the respondents hinted at poverty. This figure masks the social reality that the poor live on the margins of society, both figuratively and literally, and hence are more likely to be affected by any climatic event, which they may not have internalised.

Similarly, access to services is also one of the reasons for migration, both temporary and permanent. Migration for educational purposes is regarded as a factor by 72 per cent, followed by education (19%). One of the FGD participants in Shankarpur related a trend among some of the villagers:

Some of our brothers work in factories in India. They have taken up residence there and built houses. Their children got education there and are working there.

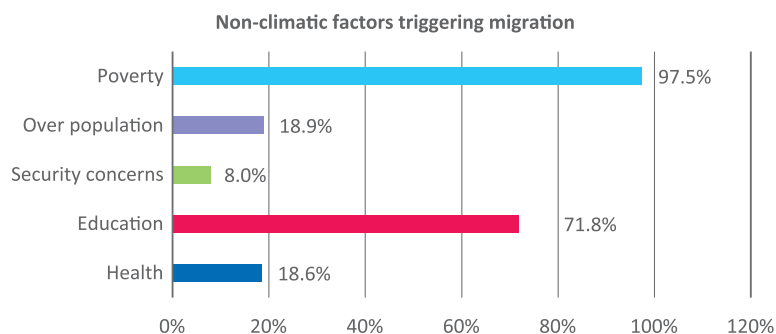
Another reason was underscored by one of the participants in FGD in Dattu:

There is increased migration nowadays because of population increase as properties that fed whole families have to be divided and there isn't sufficient food production.

Diversifying livelihoods is one of the major ways to mitigate the adverse effects of structural inequalities like poverty and climate change stressors. Therefore, migration could play a vital role in enhancing livelihood opportunities. One of the key informants of the research mentioned:

Migration as a form of livelihood diversification has been shown to occur after environmental events such as drought and flooding.

Figure 94: Role of non-climatic factors in affecting migration decisions



Source: IOM Field Survey, 2015.

7.6.9 Climate Change, environment and migration nexus

Despite none of the climatic factors being considered important by the respondents in terms of migration, the two figures below show that some climate change proxies do have some linkages with migration. For example, in the first figure, the changes of households affected by riverine flood is high for migrant households, and in the second figure, compared to the non-migrant households, more migrant households have experienced scarcity of freshwater. This is mainly because when land is lost to floods or landslide, people tend to move to the Tarai or go to India, but when drinking water sources dry up, they tend to fetch water from lower down the slope or move to another place with water source within the village.

7.7 CONCLUSION AND RECOMMENDATIONS

Based on the study, the following conclusions can be made which highlight the complex, yet subtle relationship between climate change and migration. The trend of migration is increasing in Nepal, especially in the last decade. This is evident not only in official statistics but also in villages and settlements where youths of working age are missing and have gone to find gainful employment in the urban areas or foreign countries. This is borne out by the decreasing population growth rate seen in the last census results. The absence of youths from their homes implies not only lack of employment opportunities at home but also access of job markets elsewhere.

Migration is primarily understood as an economic move for better livelihood opportunities. However, migration should be looked with a more nuanced view as a deliberate step by migrants and the migrant family to not only ameliorate their economic conditions, but also diversify their income sources as well. Studies of and research into migration should recognise that most migrants are from subsistent farming families. As farming in Nepal is mostly rain-fed, any variation in natural cycle of rain can have devastating consequences for the families. Hence, they are safeguarding themselves against any random weather events that can adversely affect their agricultural harvests.

Climate change solely does not motivate migration or any other form of mobility in the study area. This happens through various intermediaries in the form of environmental stressors and/or the quest for alternative livelihood opportunities. Weather phenomena have been perceived and recorded to have become more erratic as well as extreme, thus not only becoming unpredictable but also destructive to livelihood sources. These extreme events contribute to the rising migration in two ways: by increasing food insecurity and destroying arable and usable land. In the field research, the sampled households suggested that they do not perceive climate change proxies as a direct contributor for migration; however, the uncertainties in their livelihoods options, which could be a manifestation of climate change, environment degradation and their proxies, can indirectly motivate mobility.



When environmental changes affects productivity, you need to look for other livelihood options.

It should be understood that there cannot be just one cause or factor for migration. Migration can have many causes and forms because it can be the result of push factors as well as pull factors or a combination of both. Except in the case of forced migration, the causes of migration cannot always be easily identified as there could be social, cultural, as well as environmental factors for migration.

As it was observed in the study, the well-off households can afford to migrate compared to the less-off households. For the latter, lack of resources and capabilities to make the required move could be further exacerbated during the times of human and natural disasters, or during extreme climatic chances. These households are therefore trapped in the face of climate change and other forms of disasters. Because migration as an adaptive capacity is limited for these households, they are exposed to more vulnerabilities, face greater direct and indirect impacts in their livelihoods and have limited resilient capacities.

Recommendations and way forward

Based on the research and the review of literature and policies, the following recommendations and way forward are suggested:

Awareness raising, knowledge production and dissemination

- 1) While climate change and its effects are apparent and affect the normal natural cycles, people's awareness on climate change is still very poor. People have heard about "climate change" as a phrase but they do not always know what it means and what its effects are. Likewise, climate change adaptation is still a far cry. There is a need for massive awareness programmes to be launched in the rural areas of Nepal, especially in districts like Darchula where the level of education is very low.
- 2) As migration in Nepal is largely a male-dominated phenomenon, the increase in the number of out-migrants creates an added burden on the individuals who are left behind. In most cases the women, the wives and mothers of the migrants, have to shoulder the added responsibility that otherwise the migrant would have borne. There is a need to work with these women, primarily in the better use of remittances and various awareness programmes, like financial literacy could be launched.
- 3) The awareness campaigns or any other possible intervention activities from the local to the national level should be based on scientific research. The existing scholarly work is very scant and a lot needs to be done to better understand and establish the MECC nexus. Both government and non-governmental agencies need to invest in more research, both individually and jointly.

Capacity building

- 4) The majority of the people practice subsistence agriculture, which is dependent on rain-fed farming, and any disruption in any predictability and/or the magnitude of rainfall, temperature, and sunshine will adversely affect production and consequent food insecurity. This, in turn, leads to seasonal or temporary migration from areas that have historical trend of migration to various national, cross-border and international destinations. Therefore, households' dependence on natural systems of farming should be reduced through support for modern and scientific technologies for the people to start generating cash from selling their agricultural products. For the same, a detailed business plan, promotion of value chain, and proper market linkages are very important.

- 5) In Nepal, with every subsequent generation, already small landholdings get divided amongst siblings, primarily the men because of the social setup. With this, younger generations do not have new land that can be brought into use, leading to the decline of agricultural productivity. This will further exacerbate the impact of climate change on agricultural productivity. The impact of erosion of the fertile soil will add on to the woes. For this, on one hand, land management laws should be considered a priority, and on the other hand, the government should act towards promoting other non-farm based productive sectors too. This would significantly lower the pressure on the agricultural land.
- 6) The aforementioned factors will lead to further migration to cities and other countries in an attempt to diversify livelihood opportunities and/or supplement meagre production from agricultural activity. It could be said that in the days to come, the trend of migration will increase in an attempt to diversify incomes. However, as seen in the data, because the migrant households are more dependent on remittances, the household's occupation is less diversified, and as a result they are prone to economic vulnerabilities whenever there is a decrease in remittances. There is a crucial need for government and non-government sectors to promote various forms of alternative in situ livelihood opportunities. The governmental institutions like the Council for Technical Education and Vocational Training (CTEVT) should liaise with the other government line agencies, the non-government sector, development actors, and the private sector in promoting skills based training from the national to the local level. With the establishment of federations, a body should be established in each federal state and further at the district level so that people's access to these skill centres increases significantly.
- 7) Non-migrant households tend to diversify their occupations, and therefore, are less likely to suffer economic vulnerabilities, compared to the migrant households. However, because they are not regularly getting remittances, their chances of better adaptation, in general, is lower compared to migrant households. Migrant households, because of their exposure to different localities are in a better position to make a move whenever needed. Consequently, non-migrant households are more vulnerable on the social and environmental fronts than migrant households. On the one hand, the government and non-government actors should increase their outreach at the community level to create options for better adaptation practices at the community level. The existing indigenous knowledge could be married with scientific technologies to promote better adaptive capacities and disaster preparedness. On the other hand, the government should act as a facilitator for households that want to migrate away from any given locality which is at high risk of environmental hazards or disasters. Poverty and other social/cultural forms of bondages should not act as a trap for these underprivileged households exposing them to greater vulnerabilities.
- 8) Post-earthquake, the PDNA has highlighted the importance of engaging returning migrant workers in rebuilding and reconstruction. This marks a shift in the policy of governmental and non-governmental actors in understanding the MECC nexus. More discussion should be there to better understand various aspects of DRR and climate change adaptation and the role that financial and social remittances can play in the society. Capacity building of the government officials, from national to local levels should be done. Here, because the local level government officials and bureaucrats have better and regular access to the public, their capacity building should be considered a priority.

Policy-specific recommendations

- 9) In the context of Nepal, migration has primarily been dominated by foreign employment and trafficking. There is a dearth of policies and institutions that govern migration within the country or within the district and across the border to India. It should be understood that these two destinations are vital for remittance generation and also for seasonal, temporary and permanent migration. Further, the government should immediately work towards addressing the challenges and leveraging the opportunities arising from the unique forms of migration practiced in the areas bordering India where labourers commute and cross the international border every morning and bring back money or required goods in the evening.
- 10) Remittances could be used not just by migrant households, but also channelled towards the national economy through investment and consumption. This would positively affect the national economy, and would also be beneficial to non-recipient households. If the MoPE and MoLE come together, they can act towards utilising remittances towards climate change adaptation. In this endeavour, both financial and social remittances could be used as capital for better adaptation measures.
- 11) As remittances in the form of daily wages or remittances carried in-person are not counted by the Nepal Rastra Bank (NRB), it is difficult to accurately assess the volume of remittances being received by the communities. The number of Nepali migrants going to India is significant and many, like in the study areas, commute to bordering Indian cities on a daily or weekly basis. Counting the number of migrants/commuters and the remittances they earn is vital. Records should be maintained at all the border crossings, without hindering the passage of migrants.
- 12) There is a vital need for strengthening policies, legal frameworks and institutional capacities at a holistic level. As mentioned in the sections above, there is minimal coordination between the government agencies working in the climate change sector and migration sectors. Agencies like the IOM or the ICIMOD should work to liaise between the actors and introduce a plan of action and capacity building component to promote improved policy formulation and implementation in the MECC framework.
- 13) The government and non-government actors need to come together to address the MECC nexus by integrating migration within the broader climate change framework, promoting community-led (rather than donor-driven) sustainable livelihood opportunities that could be farm-based or off farm-based, and institutionalising climate-financing mechanisms for better adaptation and resilience from climate change. As a step forward, the government needs to strengthen the capacity of the line ministries (MoPE and MoLE) by integrating MECC into agricultural and rural development policies, forestry, natural resource management. There is also a need to strengthen baseline information, map opportunities and challenges linked to migration, and conduct vulnerability and risk assessments. This would also involve integrating migration into climate change adaptation processes by harnessing available knowledge and know-how, and scaling-up proven scientific technologies that are beneficial for promoting adaptive capacities and resilience.

8

CONCLUDING ANALYSIS OF THE REGIONAL CONTEXT

The study indicates that climate change and environmental degradation, as well as non-climatic factors, affect people in all three countries. For Bangladesh and Maldives, the major climate-induced hazards include cyclones, storm surges, coastal floods, flash floods, coastal erosion, tidal waves/tidal surge and potential sea-level rise. The people of Nepal mainly suffer from riverine flood, Glacial Lake Outburst Flood (GLOF), landslide, rainfall variation, temperature rises and heat waves. Variations in temperature and rainfall are common climatic hazards that affect all three countries. Heat waves and cold waves also affect both rural and urban populations. Environmental hazards, including freshwater scarcity, declining groundwater levels, earthquakes and water pollution are common concerns in the study locations of Bangladesh, Nepal and Maldives. Earthquakes are a serious concern, not only for the people of Nepal, but also for Bangladesh. Other hazards are very specific to the respective country, for example, Arsenic contamination is a major issue in Bangladesh. Poverty, population density, access to resources and services e.g. health, education and land ownership, also place extra pressures on people.

These hazards directly and indirectly affect natural resources and key sectors including agriculture, water, health, infrastructure, fisheries, livestock, forestry, biodiversity, and ecosystems. Furthermore, climate change and environmental degradation have the propensity to ruin crops, affect businesses and destroy other infrastructure, including homes. According to the respondents, this makes livelihood options scarce and makes communication tough, especially in the coastal regions in Bangladesh and in Maldives. Other non-climatic factors, such as higher study opportunities and low income levels, combine with climatic factors to motivate more and more people to migrate away from these climate change-affected areas, especially in Bangladesh.

Many respondents in Bangladesh identified climatic hazards as causing increasing migration flows, while the respondents in Nepal and Maldives did not identify climate change as a major factor influencing current migration flows. Other environmental hazards, such as the 2004 Tsunami in Maldives and 2015 earthquake in Nepal, devastated life and livelihoods and displaced many people which indicates the impact that environmental events can have on human populations. Non-climatic factors, including poverty, were identified as the main factors for internal migration in all three countries. The study also notes that there is lack of awareness and understanding of climate change and environmental degradation among the study population in the three countries, especially in Maldives and Nepal. Most of the study participants were not aware of the causes of the climate change, or its consequences, especially in the Maldives. Many were not aware about the potential glacial melt or sea-level rise, especially in Bangladesh and Maldives. The current policy and institutional arrangements are also not adequate to manage climate change-induced migration.

At the same time, it has also been observed from the primary data in all three countries, that in most cases, if not all, migration can help families stay afloat, if not improve their financial conditions. Thus, in a disaster prone country like Bangladesh, Nepal and Maldives, migration can be used as an adaptation strategy. However, this confirms that migration and displacement issues should be included in all relevant policies on climate change and disaster risk reduction. Since climate change and mobility affects several sectors, a multi-sectoral and whole-of-government approach is needed to address these challenges and ensure that the benefits of migration are maximized.

The study makes the following recommendations to address climate change risks and facilitate migration as adaptation strategy in the study countries:

- a) **Facilitate awareness and consultation on climate change and migration issues from national levels to grass root levels:** As mentioned above, climate change impacts are a reality on the ground, but unfortunately people's awareness of climate change and its consequences are still poor in the study countries. It is of utmost important to undertake an awareness programme on climate change and its consequences in rural areas.
- b) **Climate change and migration related knowledge generation and dissemination at all administrative levels (local to national):** Awareness campaigns and other interventions and activities, from the local to the national level, should be based on scientific research. The existing scholarly work is very scant and a lot more needs to be done to better understand and understand the MECC nexus, especially in Nepal and Maldives. The research findings and lessons need to be disseminated at local, district and national levels, and at the professional and institutional level to support effective planning and enable wider benefits.
- c) **Capacity building for vulnerable populations, migrants and officials of relevant LGIs:** It is necessary to develop the skills for potential migrants so that they can acquire decent jobs in the destination regions. Training manuals can be developed or revised (if currently available) based on the identified relevant issues and the target audiences. The officials of the local government institutes could be trained to facilitate migration issues in the affected areas. A strategy could be developed to orient and build capacity to ensure that the remittances received are used effectively by the communities or appropriately saved.
- d) **Enhanced data collection and research related to migration and climate change:** A comprehensive database on both international and internal migrants at the places of origin would really help in the policy process. Detailed research with wider geographical areas (with a larger sample size) on the relationship and significance between migration, environment and climate change are extremely important for effective facilitation and management of such migration.
- e) **Evidence based policy, legal and institutional frameworks to address climate change-induced migration:** There is strong need to enhance policy, legal and institutional frameworks to address climate change-induced migration. Improvement on coordination among the government agencies dealing with climate change, environmental degradation and migration issues would be important as an effective adaptation strategy. The relevant government agency also needs to develop a strategy with a long-term, mid-term and short term vision for planned relocation from the climate hotspots or very vulnerable areas where human security is uncertain. Migrant

Resource Centres (MRCs) can be set up in hotspots and areas where climate-induced migration is high. The main responsibility of MRCs will be to provide necessary and up to date information on jobs available, destinations and other services such as assistance with documentation, training etc. Collaborative programs can be set up with information on employment options in the destination areas, ensuring that migrating members find livelihood options. Rosters need to be established listing short-term job opportunities with the relevant skill, age, gender requirements and details at local levels in the vulnerable eco-zones. This could ensure jobs and skills matching, and allow for full/satisfactory employment on both side, i.e. for employers and job-seekers.

- f) **Programmes and projects on natural resources based livelihoods and basic services:** Programmes and projects need to be initiated to protect natural resources, low lying areas, agricultural fields and water resources to ensure the livelihoods of the local communities. Provide context-specific, low cost technological options, especially in agriculture and water supply.

REFERENCES

Adger, W.N. et al.

- 2014 Human security. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (C.B. Field et al., eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 755–791.

Adhikari, J.

- 2008 Changing Livelihoods: Essay on Nepal's Development since 1990. Martin Chautari, Kathmandu.

Adhikari, J. and M. Hobley

- 2015 'Everyone is leaving. Who will sow our fields?' The livelihood effects on women of male migration from Khotang and Udayapur districts, Nepal, to the Gulf countries and Malaysia. Himalaya, the Journal of the Association for Nepal and Himalayan Studies, 35(1):9–23.

Adhikari, K., B. Suwal and M. Sharma

- 2008 Foreign Labour Migration and Remittance in Nepal: Policy, Institution and Services. International Food Policy Research Institute, Washington, D.C.

Affi, T.

- 2011 Stealth environmental influence on economic migration in Egypt. CIGI-African Initiative Discussion Paper Series, No. 1.

Affi, T. et al.

- 2012 Climate change, vulnerability and human mobility: Perspectives of refugees from the East and Horn of Africa. United Nations University Institute for Environment and Human Security (UNU-EHS) Report No. 1, Bonn.

Agrawal, A. and N. Perrin

- 2008 Climate adaptation, local institutions, and rural livelihoods. IFRI Working Paper # W081-6. International Forestry Resources and Institutions Program. School of Natural Resources and Environment. University of Michigan.

Agrawala, S. et al.

- 2003 Development and climate change in Nepal: Focus on water resources and hydropower. Working Paper on Global Structural Policies Working Party on Development Co-operation and Environment. Organisation for Economic Cooperation and Development, COM/ENV/EPOC/DCD/DAC (2003)1/FINAL.

Ahmed, A. U. et al.

- 2012 Rainfall, food security and human mobility case study: Bangladesh. United Nations University Institute for Environment and Human Security (UNU-EHS): Report No. 2, Bonn.

Akter, T.

- 2009 Climate Change and Flow of Environmental Displacement in Bangladesh. Unnayan Onneshan The Innovators, Dhaka, Bangladesh.
- 2012 The role of micro-insurance as a safety net against environmental risks in Bangladesh. *Journal of Environment and Development*, 21(2):263–280.

Alam, M. S.

- 2013 Climate change and land use change in the eastern coastal belt of Bangladesh, elucidated by analyzing rice production area in the past and future. *Journal of Life and Earth Science*, 8:83–92.

Alamgir, M. et al.

- 2015 Analysis of meteorological drought pattern during different climatic and cropping seasons in Bangladesh. *Journal of the American Water Resources Association*, 51(3):794–806.

Anderson, S. et al.

- 2011 Climate adaptation design and piloting. CADP-N Report; Climate Adaptation Design and Piloting Project Nepal Report; Kathmandu, Nepal.

Antman, F. M.

- 2012 The impact of migration on family left behind. Discussion Paper Series, No. 6374, University of Colorado at Boulder and Institute for the Study of Labor (IZA).

Arnall, A. and U. Kothari

- 2015 Challenging climate change and migration discourse: different understanding of timescale and temporality in the Maldives. Elsevier B.V., Maldives.

Asaduzzaman, M. et al.

- 2013 Assessing the risk of loss and damage associated with the adverse effect of climate change in Bangladesh. Loss and Damage Series, International Centre for Climate Change and Development, Dhaka.

Asian Development Bank (ADB)

- 2011 Climate Change and Migration in Asia and the Pacific. ADB, Manila.
- 2012 Addressing Climate Change and Migration in Asia and Pacific. ADB, Manila.

Australian Visa Bureau

- 2012 Maldives look to mass Australian migration as solution to rising sea-levels. Australian Visa Bureau, 11 January 2012. Available from www.visabureau.com/australia/news/10-01-2012/maldives-look-to-mass-australian-migration-as-solution-to-rising-sea-levels.aspx.

Awal, M.A.

- 2013 Social safety net, disaster risk management and climate change adaptation: Examining their integration potential in Bangladesh. *International Journal of Sociology Study*, 1(4):62–72.

Azad, M.A.K., M. Z. Hossain and S. Karmakar.

- 2013 Impact of climatic elements on winter crop productivity in Rangpur area of Bangladesh. *Journal of Environmental Science and Natural Resources*, 6(2):149–155.

Bajracharya, G. and D.R. Bhandari

- 2014 Nuptiality trends and differentials in Nepal. In: Population Monograph of Nepal, Volume I (Population Dynamics). Central Bureau of Statistics, National Planning Commission, Government of Nepal, Kathmandu, pp. 71–113.

Banerjee, S., R. Black and D. Kniveton

- 2011 Migration as an Effective Mode of Adaptation to Climate Change. Policy paper for the European Commission, European Commission, Brussels.

Banerjee, S., J.Y. Gerlitz and B. Hoermann

- 2011 Labour Migration as a Response Strategy to Water Hazards in the Hindu-Kush Himalayas. International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal.

Bangladesh Bureau of Statistics

- 2010 ZilaLevelPovertyEstimates. Available from www.bbs.gov.bd/webtestapplication/userfiles/image/LatestReports (accessed 22 July 2015).
- 2011 Population and Housing Census. Available from www.bbs.gov.bd/PageWebMenuContent.aspx?MenuKey=243 (accessed 22 July 2015).
- 2013 Sample Vital Registration Survey.

Bangladesh Centre for Advanced Studies (BCAS)

- 2014 Climate Change, Migration, and Gender in Rural Bangladesh. Bangladesh Centre for Advanced Studies, Dhaka.

Bangladesh, Disaster Management Bureau (DMB)

- 2010 National Plan for Disaster Management 2010–2015. Disaster Management and Relief Division, Dhaka. Available from www.dmr.gov.bd.

Bangladesh, Government of Bangladesh

- 2011 Climate Vulnerable Forum Dhaka Ministerial Meeting Briefing Notes. Dhaka, Bangladesh.

Bangladesh, Ministry of Environment and Forests (MoEF)

- 2005 National Adaptation Programme of Action (NAPA). Prepared by MoEF, Government of the People's Republic of Bangladesh.
- 2009 Bangladesh Climate Change Strategy and Action Plan (2005, 2008).
- 2009 Generation of PRECIS scenarios for Bangladesh: Validation and Parameterization. Climate Change Cell, Dhaka.

Bangladesh Planning Commission

- 2014 Millennium Development Goals Bangladesh Country Report 2013. General Economics Division (GED), Bangladesh Planning Commission.

Barajas, A. et al.

- 2009 Do workers' remittances promote economic growth?. IMF Working Paper 09/153. International Monetary Fund (IMF).

Bhusal, Y.

- 2009 Local Peoples' Perceptions on Climate Change, Its Impacts and Adaptation Measures in Mid-Mountain Region of Nepal (A Case study from Kaski District). Unpublished thesis submitted in partial fulfilment of the requirements for the Degree of Bachelor of Science in Forestry, Tribhuvan University Institute of Forestry Pokhara, Nepal.

Bird, N.

- 2012 Climate change finance within national budgetary systems initial country experiences. National Workshop on a Climate Change Financing Mechanism. Bagamoyo.

Blandford, A. et al. (eds)

- 2009 Climate Change Perception Knowledge and Needs of Local Decision Makers in Coastal North Carolina. ENV 280: Social Science Surveys for Environmental Management, Duke University.

Bluepeace Maldives

- 2009 DHUVAAFARU: one of the most vulnerable islands to climate change. BLUEPEACE blog, February. Available from www.bluepeacemaldives.org/blog/climate-change/Dhuvaafaru-vulnerable-to-climate-change.

Boano, C., R. Zetter and T. Morris

- 2008 Environmentally displaced people. Understanding the linkages between environmental change, livelihoods and forced migration. Forced Migration Policy Briefing 1, Refugee Studies Centre, University of Oxford, London.

Bohra-Mishra, P. and D.S. Massey

- 2011 Environmental degradation and out-migration: New evidence from Nepal. In: Migration and Climate Change. Cambridge University Press, UNESCO and Cambridge, UK, pp.74–101.

Bosley, D.

- 2012 Inhabited islands need to be halved: Housing Minister. Minivan News, 24 September. Available from <http://minivannewsarchive.com/politics/inhabited-islands-need-to-be-halved-housing-minister-44298>.

Botez, R.N.

- 2011 Displacement risks from glacial melting in Nepal. In: State of Environmental Migration 2010 (F. Gemenne, P. Brückner and J. Glasser, eds.). International Organization for Migration (IOM), Geneva, pp. 67–76.

Brown, B.

- 2008 Australia should open door for climate refugees. Australia should recognize climate change refugees as a legitimate category of humanitarian refugee. GreensMPs, media release, 12 November. Available from <http://greensmps.org.au/content/media-release/australia-should-open-door-climate-refugees>.

Brown, O.

- 2007 Climate change and forced migration: Observations, projections and implications. Human Development Report 2007/2008. Human Development Report Office, Geneva.

Cambers, G. et al.

- 2006 Beach Watch- Managing our Beach Erosion. Toolkit. Live & Learn Environment Education, Fiji Islands.

Campbell, J.

- 2010 Climate-induced community relocation in the Pacific: The meaning and importance of land. In: Climate Change and Displacement: Multidisciplinary Perspectives (J. McAdam, ed.), pp. 57–79.

Castles, S.

- 2002 Environmental change and forced migration: making sense of the debate, New Issues in Refugee Research - UNHCR Working Paper 70.

Centre for Hazards and Risk Research at Columbia University

- n.d. Bangladesh Natural Disaster Profile. Available from www.ldeo.columbia.edu/chrr/research/profiles/bangladesh.html (accessed 20 April 2015).

Central Bureau of Statistics (CBS)

- 2011 Nepal Living Standards Survey 2010/11. CBS, National Planning Commission (NPC), Kathmandu.
- 2012 National Population and Housing Census 2011 (National Report). CBS, NPC, Kathmandu.
- 2014 National Population and Housing Census 2011 (Tables from Form-II). CBS, NPC, Kathmandu.

Central Bureau of Statistics (CBS), World Bank, Department of International Development (DFID), and Asian Development Bank (ADB)

- 2006 Resilience amidst Conflict: An Assessment of Poverty in Nepal 1995/96-2003/04. CBS, World Bank, DFID, and ADB, Kathmandu.

Chadburn, O. et al.

- 2013 Applying cost benefit analysis at a community level. A review of its use for community based climate and disaster risk management. Oxfam Research Reports.

Chambers, R. and G.R. Conway

- 1991 Sustainable rural livelihoods: practical concepts for the 21st century. IDS Discussion Paper 296. Institute of Development Studies. Available from www.ids.ac.uk/files/Dp296.pdf.

Chaudhary, S., G.K. Jimée and G.K. Basyal

- 2015 Trend and geographical distribution of landslides in Nepal based on Nepal DesInventar data. Paper presented at The Fourteenth International Symposium on New Technologies for Urban Safety of Mega Cities in Asia, 29–31 October 2015, Kathmandu, Nepal.

Chaudhary, R.P. et al. (eds.)

- 2007 Local Effects of Global Changes in the Himalayas: Manang, Nepal. Kathmandu: Tribhuvan University, Bergen: University of Bergen.

Chowdhury, A.M.R. et al.

- 2013 The Bangladesh paradox: Exceptional health achievement despite economic poverty. *The Lancet*, 382(9906):1734–1745.

Chowdhury, I. A. et al.

- 2012 Internal migration and Socioeconomic status of migrants: A study in Sylhet city, Bangladesh. *American Journal of Human Ecology*, 1(4):123–133.

Christian Aid

- 2007 Human tide: the real migration crisis. A Christian Aid report. Available from www.christianaid.org.uk/Images/human-tide.pdf.

Climate and Development Knowledge Network (CDKN)

- n.d. What's in it for small island developing states? The IPCC's Fifth Assessment Report. CDKN.
- 2012 FEATURE: Loss and Damage: From Defining to Understanding to Action. CDKN, Asia. Available from <http://cdkn.org/2012/09/loss-and-damage-from-defining-to-understanding-to-action/>.

Climate Vulnerable Forum

- 2011 About the Climate Change Vulnerable Forum. Climate Vulnerable Forum. Available from www.thecvf.org/web/climate-vulnerable-forum/.

Comprehensive Disaster Management Programme (CDMP)

- 2014 Trend and Impact Analysis of Internal Displacement due to the Impacts of Disaster and Climate Change. CDMP II, Ministry of Disaster Management and Relief, Dhaka.

Delft Hydraulic Laboratory

- 2001 Learning to Manage Global Environmental risks, Volume 1. Available from, www.google.mv/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#safe=active&q=Delft+Hydraulic+lab (accessed on November 2015).

Deheza, E. and J. Mora.

- 2013 Climate change, migration and security: Best-practice policy and operational options for Mexico, Royal United Services Institute. Whitehall Report Series 1–13. London.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

- 2012 Climate Change and Migration: Possible Roles for German Development Cooperation. Discussion Paper, GIZ, Eschborn, Germany.

Dhakal, K., S. Silwal and G. Khanal

- 2010 Assessment of climate change impacts on water resources and vulnerability in hills of Nepal: A case study of Dhare Khola Watershed of Dhading District. National Adaptation Program of Action to Climate Change.

Displacement Solutions

- 2012 Climate Displacement in Bangladesh The Need for Urgent Housing, Land and Property (HLP) Rights Solutions. Displacement Solutions.

Displacement Solutions and Young Power In Social Action (YPSA)

- 2014 Bangladesh Housing, Land and Property (HLP) Rights Initiative; Climate Displacement in Bangladesh: Stakeholders, Laws and Policies - Mapping the Existing Institutional Framework. Displacement Solutions and YPSA, Dhaka.

Dixit, A.

- 2011 [2067 BS] Nepalma Jalvayu Parivartan: Biggyan, Anubhav Ra Prastavharu [in Nepali]. Institute for Social and Environmental Transition-Nepal (ISET), Kathmandu.

Dixit, A., H. McGray, J. Gonzales and M. Desmond

- 2010 Ready or Not: Assessing Institutional Aspects of National Capacity for Climate Change Adaptation. World Resources Institute, Washington DC.

Dizard, W.

- 2014 Plagued by sea-level rise, Kiribati buys land in Fiji. Aljazeera America, 1 July. Available from <http://america.aljazeera.com/articles/2014/7/1/kiribati-climatechange.html>.

Drabo, A. and L. Mously Mbaye

- 2011 Climate change, natural disasters and migration: An empirical analysis in developing countries. IZA Discussion Paper No. 5927.

Elliott, L. (ed.)

- 2012 Climate Change, Migration and Human Security in South East Asia. RSIS Monograph No. 24. S. Rajaratnam School of International Studies, Singapore.

Erin, D.P.

- 2015 As waters rise, a race to migrate with dignity. The Migrationist, 9 February. Available from <http://themigrationist.net/2015/02/09/as-waters-rise-a-race-to-migrate-with-dignity/>.

Faalandand, J. and J.R. Parkinson.

- 1976 Bangladesh: The Test Case of Development. London.

Farhana, K. M., S.A. Rahman and M. Rahman.

- 2012 Factors of migration in urban Bangladesh: An empirical study of poor migrants in Rajshahi City. Bangladesh e-Journal of Society, 9(1):105–115.

Farid, K.S. et al.

- 2009 Trends in international migration and remittance flows: Case of Bangladesh. Journal of the Bangladesh Agricultural University, 7(2):387–394.

Faris, S. et al.

- 2014 From the ground up: Changing the conversation about climate change, BBC Media Action Policy Briefing, No. 11.

Field, C.B. et al.

- 2014 Technical Summary. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (C.B. Field, et al., eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, United States of America, pp. 35–94.

Food and Agriculture Organization of the United Nations (FAO)

- 1991 A View from the Beach: Understanding the Status and Needs of Fisherfolk in the Meemu, Vaavu, and Faafu Atolls of the Republic of Maldives. Fisheries and Aquaculture Department.
- 2005 Maldives: post-tsunami agricultural brief. Tsunami Reconstruction, 18 April. Available from www.fao.org/ag/tsunami/assessment/maldives.html#overview.
- 2009 Fishery and Aquaculture Country Profiles: The Republic of Maldives. Fisheries and Aquaculture Department. Available from www.fao.org/fishery/facp/MDV/en (accessed 18 August 2015).

Foresight

- 2011 Migration and Global Environmental Change: Final Project Report. The Government Office for Science, London. Available from www.gov.uk/government/uploads/system/uploads/attachment_data/file/287717/11-1116-migration-and-global-environmental-change.pdf.

Fritz, C.

- 2010 Climate Change and Migration: Sorting through Complex Issues without the Hype, Migration Policy Institute, Washington, D.C., United States of America.

Gamtam, A. P.

- 2009 Equity and livelihoods in Nepal's community forestry. International Journal of Social Forestry (IJSF), 2(2):101–122.

García, E. and D. Fernández

- 2013 Building institutional strength for migration and climate change in Colombia. IOM Weblog. 12 November. Available from <http://weblog.iom.int/building-institutional-strength-migration-and-climate-change-colombia#sthash.UR46AjMA.dpuf>.

Gartaula, H.N. and A. Niehof

- 2013 Migration to and from the Nepal Terai: Shifting movements and motives. The South Asianist, 2(2):29–51.

Gemenne, F.

- 2009 Environmental Changes and Migration Flows. Normative Frameworks and Policy Responses. Doctoral thesis, Sciences Po Paris, University of Liege, Paris.

Gemenne, F. and J. Blocher

- 2015 How can migration support adaptation? Different options to test the migration-adaption nexus - Draft policy brief for IOM.

Gemenne, F., P. Brückner and J. Glasser (eds.)

- 2011 The State of Environmental Migration 2010. International Organization for Migration, Geneva.

Gemenne, F., D. Reckien and J. Hill

- 2011 Policy options to support climate-induced migration in Asia and the Pacific. International Conference Rethinking Migration: Climate, Resource Conflicts and Migration in Europe, 13–14 October 2011, Asian Development Bank, Manila.

Gentle, P. and T.N. Maraseni

- 2012 Climate change, poverty and livelihoods: Adaptation practices by rural mountain communities in Nepal. *Environmental Science and Policy*, 21:24–34.

Ginnetti, J. and C. Lavell

- 2015 The Risk of Disaster-Induced Displacement in South Asia Technical Paper. International Development Monitoring Centre, Geneva.

Global Green Growth Institute

- 2014 Green Growth in Practice: Lessons from Country Experiences. Green Growth Best Practice Initiative, Global Green Growth Institute, Seoul.

Government of Nepal and UNDP

- 2014 Nepal Human Development Report 2014. Beyond Geography Unlocking Human Potential. Government of Nepal/National Planning Commission and UNDP, Kathmandu.

Government of Maldives

- 2006 National Adaption Programme of Action, Maldives.
2007 National Adaption Programme of Action, Maldives.

Government of Maldives, Ministry of Environment, Energy and Water

- 2011 State of the Environment – Maldives. Male', Ministry of Environment, Energy and Water.

Government of Maldives, Ministry of Environment and Energy

- 2014 Local Planning and Climate Change.
2015a Maldives Climate Change Policy Framework. Ministry of Environment and Energy, Male', Republic of Maldives.
2015b Maldives Intended Nationally Determined Contribution. Ministry of Environment and Energy, Male', Republic of Maldives.

Government of Maldives, Ministry of Home Affairs, Housing and Environment

- 2001 First National Communication to UNFCCC: Maldives.
2004 State of the Environment Maldives, 2004.

Government of Maldives, Ministry of Housing, Transport and Environment

- 2009a Maldives National Strategy for Sustainable Development. UNEP, Male'.
2009b Third National Environment Action Plan. UNEP, Male'.
2010 Coastal Monitoring, Reef Island Shoreline Dynamics and Management Implications Maldives: Final Report. Male'.

Government of Maldives, Ministry of Housing and Urban Development

- 2008 Maldives National Housing Policy. Ministry of Housing and Urban Development, Male', Maldives.

Government of Maldives, Ministry of Planning and National Development

n.d. Two years after the Tsunami

- 2004 Population Policy of the Maldives. Working Document, July 2004. Population Section, Ministry of Planning and National Development, Male', Maldives.

- 2007 Seventh National Development Plan 2006 – 2010 Creating New Opportunities. Ministry of Planning and National Development, Male', Maldives.

Government of Maldives, National Bureau of Statistics, Ministry of Finance and Treasury

- 2006a Census Analysis.
2006b Life time Migration in the Maldives.
2006c Population Projections 2006 to 2050.
2006 Population Growth and Structure.
2009 Household Income and Expenditure Survey
2014 Preliminary Results.

Government of Maldives, Presidents Office of the Republic of Maldives

- 2015 75% of the Maldivian population can be settled in Hulhumale' – President Yameen Press release. The Presidency, 10 March, Ref: 2015/85. Available from <http://presidencymaldives.gov.mv/Index.aspx?lid=11&dcid=15358>.

Government of Maldives, Ministry of Tourism and Civil Aviation

- 2008 Human Resource Situation in the Tourism Sector

Government of Pakistan, Ministry of Environment

- 2011 National Climate Change Policy. Draft. Available from www.lead.org.pk/cc/attachments/Resource_Centre/NAP/pakistan.pdf.

Government of Nepal, Ministry of Environment (MoE)

- 2010a Climate Change and Vulnerability Mapping for Nepal. MoE, Government of Nepal, Kathmandu.
2010b National Adaptation Programme of Action (NAPA). MoE, Government of Nepal, Kathmandu.
2011 Climate Change Policy Nepal (2011). MoE, Government of Nepal, Kathmandu.
2012 Mountain Environment and Climate Change in Nepal: National Report Prepared for the International Conference of Mountain Countries on Climate Change, 5–6 April 2012, Kathmandu. MoE, Government of Nepal, Kathmandu.

Government of Nepal, Ministry of Federal Affairs and Local Development (MoFALD)

- 2014 [2071 BS] Jilla Bipad Byabasthapan Yojana 2071: Darchula [in Nepali]. MoFALD, Government of Nepal, Khalanga.

Government of Nepal, Ministry of Finance (MoF)

- 2016 Economic Survey: Fiscal Year 2015/16. MoF, Government of Nepal, Kathmandu. Government of Nepal, Ministry of Home Affairs (MoHA) and Disaster Preparedness Network-Nepal (DPNet-Nepal).
2011 Nepal Disaster Report 2011. MoHA, Government of Nepal and DPNet-Nepal, Kathmandu.
2015 Nepal Disaster Report 2015. MoHA, Government of Nepal and DPNet-Nepal, Kathmandu.

Government of Nepal, Ministry of Home Affairs (MoHA), Asian Disaster Preparedness Centre (ADPC), Norwegian Geotechnical Institute (NGI), and Centre for International Studies and Cooperation (CECI)

- 2010 Nepal Hazard Risk Assessment: Part 1: Hazard Assessment. MoHA, Government of Nepal, ADPC, NGI and CECI, Kathmandu.

Government of Nepal, Ministry of Labour and Employment (MoLE)

- 2014 Labour Migration for Employment: A Status Report for Nepal: 2013/2014. MoLE, Government of Nepal, Kathmandu.
- 2016 Labour Migration for Employment: A Status Report for Nepal: 2014/2015. MoLE, Government of Nepal, Kathmandu.

Government of Nepal, Ministry of Science and Technology (MoST)

- 2011 National Framework on Local Adaptation Plans for Action. MoST, Government of Nepal, Kathmandu.

Government of Nepal, Ministry of Science, Technology and Environment (MoSTE)

- 2015 National Adaptation Plan Formulation Process: Launching Workshop Proceeding. MoSTE, Government of Nepal, Kathmandu.

Government of Nepal, National Planning Commission (NPC)

- 2002 Tenth Plan (2002-2007). NPC, Government of Nepal, Kathmandu.
- 2011 Climate-Resilient Planning: A Tool for Long-Term Climate Adaptation. Working Document. NPC, Government of Nepal, Kathmandu.
- 2013 An Approach Paper to the Thirteenth Plan (FY 2013/14–2015/16). NPC, Government of Nepal, Kathmandu.
- 2015a Nepal Earthquake 2015 Post Disaster Needs Assessment: Key Findings, Vol. A. NPC, Government of Nepal, Kathmandu.
- 2015b Nepal Earthquake 2015 Post Disaster Needs Assessment: Vol. B: Sector Reports. NPC, Government of Nepal, Kathmandu.
- 2016 Chaudhaun Yojana (Aarthik Barsa 2073/74-2075/76): Aadhar Patra [in Nepali]. NPC, Government of Nepal, Kathmandu.

Government of Nepal, Water and Energy Commission Secretariat (WECS)

- 2011 Water Resources of Nepal in the Context of Climate Change. WECS, Government of Nepal, Kathmandu.

Guadago, L.

- 2016 Human mobility in the Sendai framework for disaster risk reduction. *International Journal of Disaster Risk Science*, 7(1):30–40.

Hassan, R. et al.

- 2013 Effectiveness of social safety net programs on community resilience to hazard vulnerable population in Bangladesh. *Journal of Environmental Science & Natural Resources*, 6(1):123–129.

Haque, M.A. et al.

- 2014 Temporal variability of soil and water salinity and its effect on crop at Kalapara Upazila. *Journal of Environmental Science and Natural Resources*, 7(2):111–114.

Haveeru Daily

- 2011 Government begins relocating Maavaidhoo residents: The government is working on relocating the people of Haa Dhaal atoll Maavaidhoo to Haa Dhaal atoll Nohivaranfaru within 2-3 days. Haveeru Daily Newspaper, 23 January. Available from www.haveeru.com.mv/english/details/.

Haviland, C.

- 2011 Maldives 'Rubbish Island' is 'overwhelmed' by garbage. BBC News, 8 December. Available from www.bbc.co.uk/news/mobile/world-asia-16072020.

Hay, E.J.

- 2006 Climate Risk Profile for the Maldives. Final report. Republic of Maldives.

Hoegh-Guldberg, O.

- 1999 Climate Change, Coral Bleaching and the Future of the World's Coral Reefs, Marine Freshwater Research, CSIRO, 50, 839-66.

Hoermann B., S. Banerjee and M. Kollmair

- 2010 Labour Migration for Development in the Western Hindu Kush-Himalayas. International Centre for Integrated Mountain Development (ICIMOD), Kathmandu.

Hollis, D.

- 2008 Small sovereign archipelago seeks new, elevated homeland. *Opinio Juris*, 13 November. Available from <http://opiniojuris.org/2008/11/13/small-sovereign-archipelago-seeks-new-elevated-homeland/>.

Hossain, M.N. et al.

- 2013 Effects of flooding on Socioeconomic status of two integrated char lands of Jamuna River, Bangladesh. *Journal of Science and Natural Resources*, 6(2):37–41.

Human Rights Commission of the Maldives

- 2009 Rapid Assessment of the Employment Situation in the Maldives. Human Rights Commission of the Maldives. Available from <http://hrcm.org.mv/publications/otherreports/TheEmploymentSituationintheMaldivesEng.pdf>.

Hummel, D., M. Doeverspeck and C. Samimi (eds.)

- 2012 Climate change, Environment and Migration in Sahel: MICL working paper number 1. Migration, Climate and Environment, Frankfurt/Main.

Hunter, M.L. and E. David

- 2009 Climate Change and Migration: Considering the Gender Dimensions. Working Paper. Population Program, Institute of Behavioral Science, University of Colorado, Boulder.

Hunzai, K.

- 2013 The Role of Migration as an Adaptation Strategy in the Hindu Kush Himalayan Region. Asia-Pacific Migration and Environment Network and International Centre for Integrated Mountain Development (ICIMOD), Kathmandu.

Independent Commission for Aid Impact (ICAI)

- 2011 The Department for International Development's Climate Change Programme in Bangladesh, No. 3. Available from www.oecd.org/countries/bangladesh/49092047.pdf.

Institute of Development Studies (IDS)

- 2010 Understanding the Political Economy of Low Carbon and Climate Resilient Development: Case Study Report. The Pilot Programme for Climate Resilience in Nepal, IDS, Sussex.

Intergovernmental Panel on Climate Change (IPCC)

- 1990 Climate Change: The IPCC Impacts Assessment. Report prepared for IPCC by Working Group II. (W.J. Mc G. Tegart, G.W. Sheldon and D.C. Griffiths, eds.) Australian Government Publishing Service, Canberra.
- 1992 Climate Change: The IPCC 1990 and 1992 Assessments. IPCC First Assessment Report Overview and Policymaker Summaries and 1992 IPCC Supplement.
- 1995 Climate Change 1995: Economic and Social Dimensions of Climate Change. Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change (Core Writing Team: Bruce, James P., Hoesung Lee and E. F. Haites, eds.). Cambridge University Press, Cambridge.
- 2001 Summary for Policymakers Impacts Adaptation and Vulnerability.
- 2007 Impacts Adaptation and Vulnerability.
- 2010 Understanding Climate Change: 22 years of IPCC assessments. Brochure. Available from www.ipcc.ch/pdf/press/ipcc_leaflets_2010/ipcc-brochure_understanding.pdf.
- 2014a Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1–32.
- 2014b Climate Change 2014 synthesis report. IPCC. (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Working Group II Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. (C.B. Field, et al., eds.). Cambridge University Press, Cambridge, United Kingdom and New York.

Internal Displacement Monitoring Centre (IDMC)

- 2013 Neglected Displacement. IDMC, Geneva. Available from www.internal-displacement.org/assets/publications/2013/201309-ap-islands-neglected-displacement-thematic-en.pdf.
- 2014 Global Estimates 2014: People Displaced by Disasters. IDMC, Geneva.
- 2015 Bangladesh IDP Figures Analysis. IDMC. Available from www.internal-displacement.org/south-and-south-east-asia/bangladesh/figures-analysis (accessed 22 January 2015).

International Centre for Integrated Mountain Development (ICIMOD)

- 2007 Climate Change and the Himalayas: More Vulnerable Mountain Livelihoods, Erratic Shifts in Climate for the Region and the World. ICIMOD, Kathmandu.

2009 Living with Water Stress in the Hills of the Koshi Basin, Nepal. ICIMOD, ISET-Nepal, Kathmandu.

2011 Glacial Lakes and Glacial Lake Outburst Floods in Nepal, ICIMOD, Kathmandu.

International Institute for Environment and Development (IIED)

2011 Not only climate change: mobility, vulnerability, and Socioeconomic transformations in environmentally fragile areas of Bolivia, Senegal and Tanzania. Human Settlements Working Paper Series. Rural-Urban Interactions and Livelihood Strategies - 28.

2014a Climate change financing in Nepal. Briefing, London. Available from <http://pubs.iied.org/pdfs/17229IIED.pdf>.

2014b Climate finance governance in Bangladesh: Synergies in the financial landscape, Briefing. Available from <http://pubs.iied.org/17227iied>.

International Labour Organization (ILO)

2014a Nepal labour market update, ILO Country Office for Nepal, Kathmandu. Available from www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-kathmandu/documents/publication/wcms_322446.pdf.

2014b Skilling the Workforce: Labour Migration and Skills Recognition and Certification in Bangladesh. ILO, Dhaka.

International Organization for Migration (IOM)

2007 Migration and the Environment, Ninety-Fourth Session, Discussion Note. IOM, Geneva.

2008 Climate Change and Migration: Improving Methodologies to Estimate Flows. IOM Migration Research Series No. 33, IOM, Geneva.

2009 Disaster risk reduction, climate change adaptation: A policy perspective. Available from http://publications.iom.int/bookstore/free/DDR_CCA_report.pdf.

2010a Assessing the Evidence: Environment, Climate Change and Migration in Bangladesh. IOM, Dhaka.

2010b Migration, Climate Change and Environmental Degradation: Definitional Issues. [Online] Available from www.iom.int/jahia/Jahia/activities/by-theme/migration-climate-change-environmental-degradation/definitional-issues.

2011 Climate Change, Migration and Critical International Security Considerations. IOM Migration Research Series. No. 42. IOM, Geneva.

2012 Climate Change, Environmental Degradation and Migration, International Dialogue on Migration. No. 18. IOM, Geneva.

2013 Compendium of IOM activities on Disaster Risk Reduction.

2014a Migration, Environment and Climate Change: Evidence for Policy (MECLEP) Glossary of IOM.

2014b IOM Perspectives on Migration, Environment and Climate Change, IOM, Geneva.

2014c IOM Outlook on Migration, Environment and Climate Change, IOM, Geneva.

2014d Brief 13: A Gender Approach to Environmental Migration. IOM Outlook on Migration, Environment and Climate Change. IOM, Geneva.

- 2014e Issue in Brief: human rights, climate change, environmental degradation and migration. March Issue. Available from www.iom.int/jahia/webdav/shared/shared/mainsite/policy_and_research/policy_documents/policy_brief.pdf.
- 2014f Human rights Climate Change and Migration: A New Paradigm. IOM and Migration Policy Institute, Bangkok and Washington, D.C.
- 2015 World Migration Report 2015: Migrants and Cities, New Partnerships to Manage Mobility. IOM, Geneva.
- 2016a Atlas of Environmental Migration. IOM, Geneva.
- 2016b GMDAC Data Briefing on Environmental Migration: How much do we know? IOM, Berlin Data.
- 2016c Defining Climate Migrants – Beyond Semantics. Migration, Environment and Climate Change. IOM, Geneva.

Ionesco, D.

- 2015 COP21 Paris Agreement: A Stepping Stone for Climate Migrants. Migration, Environment and Climate Change Division, IOM Geneva.

Ionesco, D., D. Mokhnacheva, and F. Gemenne

- 2016 Atlas of Environmental Migration. Routledge, London and New York.

Iqbal, K. and P.K. Roy

- 2014 Examining the Impact of Climate Change on Migration through the Agricultural Channel: Evidence from District Level Panel Data from Bangladesh. SANDEE, Kathmandu.

Ives, J.D., R.B. Shrestha and P.K. Mool

- 2010 Formation of Glacial Lakes in the Hindu-Kush Himalayas and GLOF Risk Assessment. International Centre for Integrated Mountain Development (ICIMOD), Lalitpur.

Jalsrot Vikas Sanstha (JVS)/GWP Nepal

- 2015 Stocktaking: Climate Vulnerability on Agricultural Sector for National Adaptation Plan Process. Jalsrot Vikas Sanstha (JVS)/GWP Nepal.

Jameel, A.

- 2007 A Model to Integrate the Management of Hazards and Disasters in the National Sustainable Development Planning of the Maldives. Unpublished Master's thesis for the University of Canterbury, United Kingdom.

Jaquet, S. et al.

- 2015 Does outmigration lead to land degradation? Labour shortage and land management in a western Nepal watershed. *Applied Geography*, 62:157–170.

Kabir, M. and R. Salim

- 2013 Encyclopedia of Emerging Markets. In: Bangladesh. Gale Publishing, New York. p. 17–27.

Kaelin, W.

- 2015 Discussion Paper on the Relationship between Climate Change and Human Mobility. Nansen Initiative Secretariat, Geneva.

Kamruzzaman, M.

- 2015 Farmers' perceptions on climate change: A step toward climate change adaptation in Sylhet hilly region. *University Journal of Agricultural Research*, 3(2):53–58.

Kansakar, V.B.S.

- 2003 International Migration and Citizenship in Nepal. In: *Population Monograph of Nepal, Volume I*. Central Bureau of Statistics (CBS), National Planning Commission, Government of Nepal, Kathmandu, pp. 85–119.

KC, B.K.

- 2003 Internal Migration in Nepal. In: *Population Monograph of Nepal, Volume I*. Central Bureau of Statistics (CBS), National Planning Commission, Government of Nepal, Kathmandu, pp. 121–168.

Kelman, I.

- n.d. Climate Change and Displacement. Island evacuation. Case study.
2011 Participatory action research for dealing with disasters on islands. *Island Studies Journal*, 6(1):59–86.

Kelman, I. and J.J. West

- 2009 Climate change and small island developing states: A critical review. *Ecological and Environmental Anthropology*, 5(1).

Kelman, I., J. Mercer and J.J. West

- 2009 Combining different knowledge's: community-based climate change adaptation in small island developing states. *Participatory Learning and Action Notes*, 60, pp. 41–53. Available from <http://pubs.iied.org/G02812.html> (English and Arabic).

Khan, M.F.A. and I.M. Shahidul

- 2013 Vulnerability to Climate Induced Drought. Study Report. Comprehensive Disaster Management Programme (CDMP).

Khatriwada, P.P.

- 2009 Conflict Induced Migration in Nepal: A Social Inclusion Perspective. Doctoral dissertation submitted to the Faculty of Humanities and Social Sciences, Tribhuvan University, Kathmandu.
2014 International migration and citizenship in Nepal. In: *Population Monograph of Nepal, Volume I (Population Dynamics)*. Central Bureau of Statistics, National Planning Commission Secretariat, Government of Nepal, Kathmandu, pp. 211–39.

Khatriwada, S.

- 2011 Vulnerability Assessment of Indigenous People's Livelihoods due to Climate Change in Darakh VDC of Kailali District, Thesis for the Degree of Master of Science in Environment Management, SchEMS, Kathmandu, Nepal.

Kissinger, G. et al.

- 2013 Planning Climate Adaptation in Agriculture. Meta-Synthesis of National Adaptation Plans in West and East Africa and South Asia. CCAFS Report No. 10. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), Copenhagen.

Kniveton, D., P. Rowhani and M. Martin

- 2013 Future migration in the context of climate change. Climate Change Related Migration in Bangladesh Briefing Paper No. 3.

Kreft, S. et al.

- 2015 Global Climate Risk Index 2014: Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2012 and 1993 to 2013, Briefing Paper. German Watch, Bonn.

Laczko, F. and C. Aghazarm (eds.)

- 2009 Migration, Environment and Climate Change: Assessing the Evidence, IOM. Geneva.

Lang, O.

- 2009 Maldives leader in climate change stunt. BBC News, 17 October. Available from http://news.bbc.co.uk/2/hi/south_asia/8312320.stm.

Leighton, M., X. Shen and K. Warner.

- 2011 Climate change and migration: Rethinking policies for adaptation and disaster risk reduction. Publication Series of UNU-EHS. Bonn.

Lubna, H.

- 2012 Nearly 60 islands hit with water crisis. Maldives Independent, 8 April. Available from <http://reliefweb.int/report/maldives/nearly-60-islands-hit-water-crisis>.

Luetz, J.M.

- 2013 Climate migration - Preparedness Informed Policy Opportunities Identified during Field Research in Bolivia, Bangladesh and Maldives. Unpublished PhD thesis for the University of New South Wales.

Macchi, M. et al.

- 2011 Climate Variability and Change in the Himalayas. ICIMOD, Kathmandu.

Maclellan, N.

- 2012 Kiribati's policy for "migration with dignity." Devpolicyblog, 12 January. Available from http://devpolicy.org/kiribati_migration_climate_change20120112/.

Maharjan, M.

- 2014 Climate Change Adaptation Projects and Major Activities on Climate Financing in Nepal. Global Water Partnership (GWP) Nepal/Jalsrot Vikas Sanstha (JVS), Kathmandu.

Maharjan, A., S. Bauer and B. Knerr

- 2013 Migration for Labour and its Impact on Farm Production in Nepal. Working Paper IV. Centre for the Study of Labour and Mobility, Kathmandu. Mainlay, J. and S.F. Tan.
- 2012 Mainstreaming Gender and Climate Change in Nepal. IIED Climate Change Working Paper No. 2. International Institute for Environment and Development (IIED), London.

Mallick, B.

2014 Cyclone-induced migration in southwest coastal Bangladesh. *ASIEN*, 130:60–81.

Mallick, B. and B. Etzold (eds.)

2015 Environment, Migration and Adaptation Evidence and Politics of Climate Change in Bangladesh. International Centre for Climate Change and Development (ICCCAD), Dhaka.

Manandhar, B.

2015 Remittance and earthquake preparedness. *International Journal of Disaster Risk Reduction*, 15:52–60.

Manandhar, S. et al.

2011 Adapting cropping systems to climate change in Nepal: A cross-regional study of farmers' perception and practices. *Regional Environmental Change*, 11(2):335–348.

Maplecroft, V.

2014 Climate Change Vulnerability Index. Available from <http://maplecroft.com/portfolio/new-analysis/2014/10/29/climate-change-and-lack-food-security-multiply-risks-conflict-and-civil-unrest-32-countries-maplecroft/> (accessed 26 July 2015).

Marshall, N.A. et al.

2009 A Framework for Social Adaptation to Climate Change; Sustaining Tropical Coastal Communities and Industries. IUCN, Switzerland.

Martin, S.

2009 Managing environmentally induced migration. In: *Migration, Environment and Climate Change: Assessing the Evidence* (F. Laczko and C. Aghazarm, eds.). International Organization for Migration (IOM), Geneva, pp. 353–384.

Martin, M. et al.

2013 Migration in Bangladesh and its sensitivity to climate change and variability. *Climate Change Related Migration in Bangladesh Briefing Paper No. 2*.

Martin, M., D. Kniveton and T. Siddiqui

2012 Making migration decisions amid climate change in Bangladesh. *Climate Change Related Migration in Bangladesh Briefing Paper No. 1*.

Massey, D.S., W. Axinn and D. Ghimire

2007 Environmental Change and Out-migration: Evidence from Nepal. Population Studies Centre, University of Michigan, Michigan.

Massey, D.S. et al.

2010 Community Services and Out-Migration. *International Migration*, 48(3):1–41.

Mathema, P. et al.

2012 Information Note for COP18 to the UNFCCC and CMP8 to the Kyoto Protocol. Ministry of Science, Technology and Environment, Kathmandu.

May, J.F.

- 2016 Maldives' Population Dynamics: Policy Prospects for Human Growth and Opportunity, United Nations Population Fund (UNFPA). Available from, <http://countryoffice.unfpa.org/maldives/?reports=13941>.

Mayer, B.

- 2011 Migration as a sustainable adaptation strategy. Presentation at the Second Conference of the Initiative on Climate Adaptation Research and Understanding through the Social Sciences: Climate Vulnerability and Adaptation: Marginal Peoples and Environments, 5–8 May 2011. Ann Arbor, MI.

Mekong River Commission (MRC)

- 2014 Addressing cross-sector and trans-boundary issues in adaptation to climate change. Second Mekong Climate Change Forum, Cambodia.

Mercer, J.

- 2010 Disaster risk reduction or climate change adaptation: Are we reinventing the wheel? *Journal of International Development*, 22(2):247–264.

Merret, N.

- 2015 Last resort. HIMAL South Asian, 30 March. Available from <http://himalmag.com/maldives-bangladeshi-migrant-workers/>.

Miah, G. et al.

- 2010 Resource degradation and livelihood in the coastal region of Bangladesh. *Frontiers of Earth Science in China*, 4(4):427–437.

Minivan News - Archive

- 2014 Haa Alif Dhidhoo hit by 'Udha' waves, 10 June. Available from <http://minivannewsarchive.com/environment/haa-alif-dhidhoo-hit-by-udha-waves-86757>.

Mishra, B.

- 2015 Relaying Remittance. *The Kathmandu Post*, 29 March. Available from <http://kathmandupost.ekantipur.com/printedition/news/2015-05-28/relaying-remittance.html>.

Moench, M. and A. Dixit (eds.)

- 2004 Adaptive Capacity and Livelihood Resilience: Adaptive Strategies for Responding to Floods and Droughts in South Asia. The Institute for Social and Environmental Transition, International, Boulder, and the Institute for Social and Environmental Transition, Colorado and Kathmandu.

Mohamed, K.

- 2000 Census of the Maldives: Analytical Report. Chapter IX: Internal Migration. Available from www.planning.gov.mv/publications/analytical_report/html/Source/ChapterIX.pdf.

Mukherjee, A.N.

- 2014 Incorporating Gender and Poverty Analysis in the Climate Public Expenditure and Institutional Review: A Methodological Note. UNDP.

Müller-Böker, U. and S. Thieme

- 2007 Livelihood strategies in a marginal area of Nepal (Far West Nepal), with an emphasis on labour migration to India. In: Issues in Geographical Marginality: Papers presented during the Meetings of the Commission on Evolving Issues of Geographical Marginality in the Early 21st Century World, 2001–2004 (G. Jones, W. Leimgruber and E. Nel, eds.). Rhodes University, Grahamstown.

Nachmany, M. et al.

- 2014 The GLOBE Climate Legislation Study: A Review of Climate Change Legislation in 66 Countries. GLOBE International and the Grantham Research Institute, London School of Economics, London.

Nahid, A.

- 2012 Dhuvaafaru: A Safe Island from Disasters. Unpublished degree thesis for the Maldives National University.

Naser, M.M.

- 2012 Climate change, environmental degradation, and migration: A complex nexus. William and Mary Environmental Law and Policy Review, 36(3).

National Disaster Management Centre

- 2013 National progress reports on the implementation of the Hyogo Framework for Action (2011–2013). Male'.

National Human Rights Commission (NHRC)

- 2012 International Conference on the Rights of Migrant Workers. Kathmandu.

Nepal Climate Vulnerability Study Team (NCVST)

- 2009 Vulnerability through the Eyes of the Vulnerable: Climate Change Induced Uncertainties and Nepal's Development Predicaments. Institute for Social and Environmental Transition-Nepal (ISET-N) and Institute for Social and Environmental Transition (ISET), Kathmandu.

Nepal Hydrological and Meteorological Research Centre and Consultancy Pvt. Ltd (NHRMCC).

- 2015 Study of Climate and Climatic Variation over Nepal (Draft Report). Department of Hydrology and Meteorology, Ministry of Science, Technology and Environment, Kathmandu.

Nepal Rastra Bank (NRB)

- 2009 Remittance Inflow. NRB, Kathmandu. Available from www.nepalbiznews.com/newsdata/Biz-News/remittance_news.html.

Nishat et al.

- 2013 A range of approaches to address loss and damage from climate change impacts in Bangladesh. Loss and Damage Series. Centre for Climate Change and Environmental Research, Dhaka.

Ober, K.

- 2014 How the IPCC views migration. An assessment of migration in the IPCC AR5 WGII report. TransRe Fact Sheet, No. 1.

Oliver-Smith, A. and X. Shen (eds.)

- 2009 Linking Environmental Change, Migration & Social Vulnerability. United Nations University Institute for Environment and Human Security (UNU-EHS), No. 12, Bonn.

Pant, B.

- 2006 Remittance inflows to Nepal: Economic impact and policy options. *Economic Review*, 18:20–36.
- 2011 Harnessing remittances for productive use in Nepal. *Economic Review*, 23:1–20.

Pant, K.P.

- 2011 Economics of climate change for smallholder farmers in Nepal: A review. *The Journal of Agriculture and Environment*, 12:113–26.

Parvez, S.

- 2015 Silenced by salinity. *The Daily Star*, 17 January. Available from www.thedailystar.net/silenced-by-salinity-60289.

Paudel, P., S.B. Regmee and S.N. Upadhyay

- 2013 Overview of June 2013 Flood and Landslides with Focus on Darchula Disaster. Jalsrot Vikas Sanstha (JVS)/Global Water Partnership (GWP) Nepal, Kathmandu.

Piguet, E.

- 2011 Migration/climate change nexus: An assessment. International Conference on Rethinking Migration: Climate, Resource Conflicts and Migration in Europe, 13–14 October 2011.

Poudyal, B.M. and A. Shakya

- 2010 Environmental Degradation in Nepal. Disaster Preparedness-Network (DP-Net), Kathmandu.

Practical Action and Nepal Risk Reduction Consortium

- 2014 [Understanding the Role of Remittances in Reducing Earthquake Risk. Kathmandu, 20.](#)

Pradhan, N.S. et al. (eds.)

- 2012 Role of Policy and Institutions in Local Adaptation to Climate Change – Case studies on responses to too much and too little water in the Hindu Kush Himalayas. ICIMOD, Kathmandu.

Rabbani, M.G.

- 2015 A Framework on Climate Change and Migration, prepared for CSO Advocacy event organized by BCAS, 5 June 2015, Dhaka, Bangladesh.

Rabbani, M.G. et al.

- 2015 Climate Change and Food Security in Vulnerable Coastal Zones of Bangladesh. In Habiba, U., Abedin, M.A., Hassan, A.W.R., Shah, R. (eds.) *Food Security and Risk Reduction in Bangladesh*. Springer, Japan.

Rabbani, M.G., et al.

- 2010 Impacts of Industrial Pollution on Human Health: Empirical Evidence from an Industrial Hotspot (Kaliakoir) in Bangladesh, *Asian Journal of Water, Environment and Pollution*, 7 (1), forthcoming.

Rahman, M.R.

- 2010 Impact of Riverbank Erosion Hazards in the Jamuna Floodplain Areas in Bangladesh. *Journal of Science Foundation*, 8(1–2):59.

Rahman, M.S.

- 2014 Population Displacement due to River Erosion in Sirajgonj District: Socioeconomic Impact and Food Security. A thesis submitted to Bangladesh Agriculture University, Mymensing.

Rahman, S.U.

- 2014 Impacts of Flood on the Lives and Livelihoods of People in Bangladesh: A Case Study of a Village in Manikganj District. A dissertation for the Degree of Masters in Disaster Management, BRAC University, Dhaka.

Rahman, M.Z. and S.A. Siddiquee

- 2015 Climate change and farming vulnerability in the coast of Bangladesh. *Journal of Natural Science Research*, 5(3):202–210.

Raleigh, C., L. Jordan and I. Salehyan

- n.d. Assessing the Impact of Climate Change on Migration and Conflict. The Social Development Department, The World Bank, Washington, D.C.

Ramesh, R.

- 2008 Paradise almost lost: Maldives seek to buy a new homeland. *The Guardian*, 10 November. Available from www.theguardian.com/environment/2008/nov/10/maldives-climate-change?loc=interstitialskip.

Ramiz, A. M.

- 2010 Impact of Extreme Climate Events on Maldives, Presentation at the First Session of the South Asian Climate Outlook Forum (SASCOF - 1), Pune, India, 13–15 April 2010.

Ratha, D.

- 2013 The impact of remittances on economic growth and poverty reduction. Migration Policy Institute Policy Brief, 8.

Ratha, D., S. Mohapatra and A. Silwal

- 2010 Outlook for Remittance Flows (2010/11), Migration and Development Brief, 12, The World Bank.

Ratha, D. et al.

- 2015 Migration and Remittances: Recent Developments and Outlook', Migration and Development Brief, 24, The World Bank.

Red Cross

(n.d) The Maldives – Two years after the tsunami

Reed, U.E.

2013 Understanding the Islanders: Climate change in context. Available from: <http://ourworld.unu.edu/en/understanding-the-islanders-climate-migration-in-context>.

Refugee Studies Centre

2005 Tsunami learning from the humanitarian response. Forced Migration Review,
2015 Disasters and displacement in a changing climate. Forced Migration Review, Issue 49, Oxford.

Regmi, R.R.

1994 Deforestation and rural society in the Nepalese Terai. Occasional Papers in Sociology and Anthropology, 4.

Regmi, B.R. and D. Bhandari

2012 Climate change governance and funding dilemma in Nepal. TMC Academic Journal, 7(1):40–55.
2013 Climate change adaptation in Nepal: Exploring ways to overcome the barriers. Forest and Livelihood Journal, 11:43–61.

Republic of Philippines, Climate Change Commission

n.d. National Climate Change Action Plan 2011–2028. Climate Change Commission, Available from http://adaptationmarketplace.org/data/library-documents/NCCAP_TechDoc.pdf.

Republic of the Marshall Islands

2011 Republic of the Marshall Islands National Climate Change Policy Framework. Available from www.undp-alm.org/sites/default/files/downloads/rmi_nccp_2011.pdf.

Roy, D. C.

n.d. Vulnerability and Population Displacements Due to Climate-induced Disasters in Coastal Bangladesh. University of Salzburg, Salzburg.

Saxena, L.P.

2014 South-South Technology Transfer: A Viable Means of Adapting to Climate Change. SAWTEE Working Paper No. 02/14, South Asia Watch on Trade, Economics and Environment (SAWTEE), Kathmandu.

Savage, K. and P. Harvey (eds.)

2007 Remittances during Crises Implications for Humanitarian Response. Humanitarian Policy Group Report 25, Overseas Development Institute, London, 2.

Scott, A.O.

2012 In paradise, and closer than ever to disaster. ‘The island president’: Jon Shenk documentary at film festival. New York Times, 27 March. Available from www.nytimes.com/2012/03/28/movies/the-island-president-jon-shenk-documentary-at-film-forum.html.

Seeds Asia

- 2008 Capacity Building of Coastal Communities on Disaster Risk Reduction, www.seedsasia.org/eng/wp-content/uploads/2013/03/Final-Report1.pdf.

Shafeeqa, F.

- 1996 The Role of Non-governmental Organizations in Contributing to the Population Programs of the Maldives. Unpublished MSc Thesis, University of Cardiff UK.
- 2011a Madikilambu 1 A Rapid Assessment of Perceptions.
- 2011b Madikilambu 2 A Rapid Assessment of Perceptions.

Shafeeqa F. and H. Clothier

- 2009 A Rapid Assessment of Perceptions. Regional development project.

Shafeeqa F. and J. Smith

- 2009 Community Mobilization and Environmental Awareness Strategy. Regional Development Project.

Shafeeqa F. et al.

- 2006 A Rapid assessment of Perceptions into Environmental Management in the Maldives. Volume 1.

Shaig, A.

- 2006 Climate Change Vulnerability and Adaptation Assessment of the Maldives Land and Beaches. Research Paper. Centre for Disaster Studies School of Tropical Environment Studies and Geography, James Cook University, Townsville, Australia. Available from www.napa-pana.org/private/modules/knowledgebox/io/file.php?entry=628&field=22.
- 2009 Settlement Planning for Natural Hazard Resilience in Small Island States: The Population and Development Consolidation Approach. Unpublished PhD Thesis, James Cook University, Townsville.

Shamsuddoha, M. et al.

- 2012 Displacement and Migration from Climate Hot-spots in Bangladesh: Causes and Consequences. Centre for Participatory Research and Development and Action Aid Bangladesh, Dhaka.
- 2014 Analysis of variability in rainfall patterns in greater Rajshahi division using GIS. Journal of Environmental Science and Natural Resources, 7(2).

Shareef, A. et al.

- 2015 Baseline Analysis of Adaptation Capacity and Climate Change Vulnerability Impacts in the Tourism Sector. Ministry of Tourism, Male', Republic of Maldives. Available from www.tourism.gov.mv/downloads/publications/Baseline.pdf.

Sharma, J.R.

- 2011 The Impact of Environmental Change on Labour Migration from Nepal to the Gulf States. Migration and Global Environmental Change. Foresight CS10.

Sharma, K.P.

- 2009 Climate Change: Trends and Impacts on Livelihood of People. Jalsrot Vikas Sanstha/Global Water Partnership-Nepal, Kathmandu.

Sharma, J.R. and S. Sharma

- 2011 Enumerating Migration in Nepal. Working Paper I, Centre for the Study of Labour and Mobility (CESLAM), Kathmandu.

Sharma, S. and D. Thapa

- 2013 Taken for Granted: Nepali Migration to India. Research Paper III, Centre for the Study of Labour and Mobility (CESLAM), Kathmandu.

Sharma, S. et al.

- 2014 State of Migration in Nepal. Research Paper VI, Centre for the Study of Labour and Mobility (CESLAM), Kathmandu.

Sherpa, D.

2010. Labour Migration and Remittances in Nepal. International Centre for Integrated Mountain Development (ICIMOD), Lalitpur.

Shrestha, B.

- 2008 Contribution of foreign employment and remittances to Nepalese economy. *Economic Review*, 20:1–15.

Shrestha, N.R., R.P. Velu and D. Conway

- 1993 Frontier migration and upward mobility: The case of Nepal. *Economic Development and Cultural Change*, 41(4):787–816.

Shrestha, S.S. and P. Bhandari

- 2007 Environmental security and labor migration in Nepal. *Population and Environment*, 29(1):25–38.

Siddiqui, M. R.

- 2014 Patterns and factors of out-migration in the Meghna Estuarine Islands of Bangladesh. *Malaysian Journal of Society and Space*, 10(1):11–24.

Siddiqui, T.

- 2010 Impact of climate change: Migration as one of the adaptation strategies. Working Paper Series No. 18, RMMRU, Dhaka.

Siddiqui, T. and Md. S. Reza.

- 2014 Labour Migration from Bangladesh 2013. Achievements and Challenges. RMMRU, Dhaka.

Siddiqui, T. et al.

- 2013a Staggering scale of climate-related migration in Bangladesh. *Climate Change Related Migration in Bangladesh Briefing Paper No. 5.*
- 2013b Migration – from threat of climate change to adaptation tool: Policy choices for development partners of Bangladesh. *Climate Change Related Migration in Bangladesh Briefing Paper No. 6.*
- 2014 Transforming challenges into part of the solution: Climate-change related migration. *Climate Change Related Migration in Bangladesh Briefing Paper No. 7.*

Silbert, E.M.

- 2011 Small Island Economic Vulnerability to Natural Disasters. Unpublished PhD thesis, University of Florida.

Smith, A. H., E.O. Lingas and M. Rahman

- 2000 Contamination of drinking-water by arsenic in Bangladesh: a public health emergency. *Bulletin of the World Health Organization*, 78(9):1093–1103. Available from [www.who.int/bulletin/archives/78\(9\)1093.pdf](http://www.who.int/bulletin/archives/78(9)1093.pdf).

Socialist Republic of Viet Nam

- 2011 National Strategy on Climate Change. Government Portal. Available from <http://chinhphu.vn/portal/page/portal/English/strategies/strategiesdetails%3FcategoryId%3D30%26articleId%3D10051283>.

South Asia Co-operative Environment Programme (SACEP)

- 2014 Post 2015 South Asia Development Agenda. Colombo.

South Asia Watch on Trade, Economics and Environment (SAWTEE)

- 2002 Farmers' Rights and Mountain Communities in Nepal. Policy Brief, 2.

South Asian Association for Regional Cooperation (SAARC)

- 2005 Social Charter of the South Asian Association for Regional Cooperation. SAARC Secretariat, Kathmandu, Nepal.
- 2007 SAARC Action Plan on Climate Change. SAARC Secretariat, Kathmandu.
- 2014 Kathmandu Declaration. SAARC Secretariat, Kathmandu.

Sri Lanka, Ministry of Foreign Employment Promotion and Welfare

- 2013 Migration Profile of Sri Lanka. Sri Lanka Bureau of Foreign Employment, Colombo, Sri Lanka.

Srinivasan, G., Jothiganesh, S. and Subbiah, A. R.

- 2012 Development of a high resolution regional climate model: Climate change scenarios and their interpretation for the Maldives. Maldives: Ministry of Environment and Energy.

Subedi, B.P.

- 2014 Urbanisation in Nepal: Spatial pattern, social demography and development. In: Population Monograph of Nepal. Central Bureau of Statistics (CBS), National Planning Commission (NPC), pp. 95–154.

Susmita, D. et al.

- 2014 Climate change, soil salinity, and the economics of high-yield rice production in coastal Bangladesh. Policy Research Working Paper 1. The World Bank.

Sustainable Development Policy Institute (SDPI)

- 2014 Sustainable Development in South Asia: Shaping the Future. SDPI, Lahore.

Suwal, B.R.

- 2014 Internal migration in Nepal. In: Population Monograph of Nepal, Volume I (Population Dynamics). Central Bureau of Statistics, National Planning Commission Secretariat, Government of Nepal, Kathmandu, pp. 241–83.

Syed, M.A and M.A. Amin

- 2016 Geospatial modeling for investigating spatial pattern and change trend of temperature and rainfall. *Climate*, 4(2):21.

Sylhet Agricultural University (SAU)

- 2015 Farmers' Perceptions on Climate Change: A Step toward Climate Change Adaptation in Sylhet Hilly Region.

Synnott, P.

- 2012 Climate Change, Agriculture, & Food Security in Nepal: Developing Adaptation Strategies and Cultivating Resilience. Mercy Corps Nepal. Available from <http://nepal.mercycorps.org/pdf/climate-change-agriculture-and-food-security-in-nepal.pdf>.

Tacoli, C.

- 2009 Crisis or adaptation? Migration and climate change in a context of high mobility. In: Population Dynamics and Climate Change (J.M. Guzman et al., eds.), IIED, London.

Tanner, T. et al.

- 2007 ORCHID: Piloting climate risk screening in DFID Bangladesh, Detailed Research Report. Institute of Development Studies, University of Sussex, UK.

Thakur, J.K. et al.

- 2011 Arsenic contamination of groundwater in Nepal – An overview. Water; Special Issue Managing Water in a Changing World: Selected Papers from the 7th Conference of the Commission on Water Sustainability, 3:1–20.

The Asia Foundation

- 2012 A Situation Analysis of Climate Change Adaptation Initiatives in Bangladesh. Dhaka.

Timalsina, K.P.

- 2007 Rural Urban Migration and Livelihood in the Informal Sector A Study of Street Vendors of Kathmandu Metropolitan City, Nepal. Unpublished Master of Philosophy Thesis in Development Studies submitted to the Department of Geography Norwegian University of Science and Technology (NTNU), Trondheim, May 2007.

Timsina, N.P.

- 2011 Climate Change Phenomenon in Nepal. A paper presented in South Asian Climate Conference, 1–2 January 2011, organised by ANPFA and SAAPE.

Transparency Maldives

- 2013 An assessment of climate finance governance in the Maldives. Transparency Maldives.

Uddin, A.M.K.

- 2006 Climate Change Impact Modeling Institutional Road Map. Climate Change Cell, Department of Environment, Dhaka.

Uddin, A.F.M.A. and J.K. Basak

- 2012 Effects of Riverbank Erosion on Livelihood. Unnayan Onneshan–The Innovators, Bangladesh.

UK Aid

- 2010 Climate Change and Education Maldives.

UK Climate Change and Migration Coalition

- 2014 Migration as Adaption: Exploring Mobility as a Coping Strategy for Climate Change. UNESCO.
- 2000 Education for All – The year 2000 Assessment Reports, Maldives.
- 2011 Migrations and Climate Change. Edited by E. Piguet (University of Neuchâtel) A. Pécoud (UNESCO) and P. De Guchteneire (UNESCO).
- 2014 Migrating to adapt. Contesting dominant narratives in climate change and migration. Discussion paper by TERI.

UNFCCC

- 2010 National Environment Economic Development Studies. Ministry of Housing and Environment.

United Kingdom, Government Office for Science

- 2011 Foresight: Migration and Global Environmental Change, Final Project Report. London Available from www.gov.uk/government/uploads/system/uploads/attachment_data.

United Nations (UN) and United Nations International Strategy for Disaster Reduction (UNISDR)

- 2009 Drought Risk Reduction Framework and Practices: Contributing to the Implementation of the Hyogo Framework for Action. International Strategy for Disaster Reduction (ISDR), Geneva.

United Nations Development Programme (UNDP)

- n.d. CBA Country Program Strategy, Maldives.
- 2006 Developing a Disaster Risk Profile for the Maldives. Volume 1 and 2.
- 2009a Cost Benefit Study of Disaster Risk Mitigation Measures in Three Islands in the Maldives.
- 2009b Detailed Risk Assessment in Maldives. Volume 111.
- 2011 Chapter 4. Remittances. In: Towards Human Resilience: Sustaining MDG Progress in an Age of Economic Uncertainty. UNDP, p. 129.
- 2013 Internal Migration in Bangladesh: Character, Drivers and Policy Issues. UNDP, Bangladesh.

United Nations Educational, Scientific and Cultural Organization (UNESCO)

- 2013 World Social Science Report: Changing Global Environments. International Social Science Council, OECD Publishing and UNESCO Publishing.

United Nations Environment Programme (UNEP)

- 2011 Climate Change, Migration and Conflict in the Sahel. UNEP, IOM, OCHA, UNU, CILSS.
- 2002 State of Environment Maldives. UNEP.

United Nations Framework Convention on Climate Change (UNFCCC)

- 2014 Statement delivered by Nepal on behalf of The Least Developed Countries (LDC) Group Opening of the High Level Segment COP-20 / CMP- 10 Lima.

United Nations High Commissioner for Refugees (UNHCR)

- 2009 Climate Change, Natural Disasters and Human Displacement: a UNHCR Perspective.
- 2012 Protecting People Crossing Borders in the Context of Climate Change Normative Gaps and Possible Approaches. Legal and Protection Policy Research Series, Division of International Protection.

United Nations University (UNU)

- 2014a Integrating Human Mobility Issues within National Adaptation Plans. United Nations University Nansen Initiative Joint Policy Brief 9, 2.
- 2014b Planned Relocation, Disasters and Climate Change: Consolidating Good Practices and Preparing for the Future. UNHCR, San Remo.

UNOCHA

- n.d. Internal Displacement – Overview. Available from www.unocha.org/what-we-do/advocacy/thematic-campaigns/internal-displacement/overview.

Upreti, B.R.

- 2013 Human Security in Nepal: Concepts, Issues and Challenges. Nepal Institute for Policy Studies and South Asia Regional Coordination Office of NCCR (North-South), Kathmandu.

Upreti, B.R. et al. (eds.)

- 2010 The Remake of a State: Post-conflict Challenges and State Building in Nepal. South Asia Regional Coordination Office of the Swiss National Centre of Competence in Research (NCCR North-South) and Human and Natural Resources Studies Centre (HNRSC), Kathmandu University, Dhulikhel

United States Agency for International Development (USAID)

- 2012 Climate Vulnerability Assessment Islands of Dhidhdhoo and Hinnavaru, Maldives.

Vishan, I.

- 2013 Key Determinants of Environmental Stakeholders Response to Environmental Issues in the Maldives. Thesis submitted in partial fulfilment of the requirements of the University of Brighton for a Doctor of Philosophy.

Wang, S.Y. et al.

- 2013 What caused the winter drought in western Nepal during recent years? Journal of Climate, 26(21):8241–56.

Warner, K.

- 2012 Environmental Change and Migration: Issues for European Governance and Migration Management. Available from <http://migrationeducation.de/56.1.html?&rid=208&cHash=6cf222c08c5309a7e2288d393f5ba88d>.

Warner, K. et al.

- 2013 Changing climate, moving people: Farming migration, displacement and planned relocation. UNU-EHS publication Series, Policy Brief No. 8.

World Bank, DFID, ADB

- 2006 Resilience amidst Conflict: An Assessment of Poverty in Nepal: 1995-1996 and 2003-2004. Central Bureau of Statistics (Government of Nepal), The World Bank, UK Department for International Development and Asian Development Bank.

World Bank

- 2011 Large scale migration and remittance in Nepal: Issues, challenges and opportunities, Report No. 55390-NP, Poverty Reduction and Economic Management Sector Unit, South Asia, World Bank.
- 2013 4° Turn Down the heat: Climate Extremes, Regional Impacts and the Case for Resilience. A report for the World Bank by the Potsdam Institute for Climate Impact Research and Climate Analytics.

World Health Organization (WHO)

- 2008 Country co-operation strategy at a glance. Available from: www.who.int/countryfocus/cooperation_strategy/ccsbrief_mdv_en.pdf.

Zahid, A.

- 2011 The influence of Asian monsoon variability on precipitation patterns over the Maldives. Unpublished PhD thesis for the University of Canterbury, New Zealand.

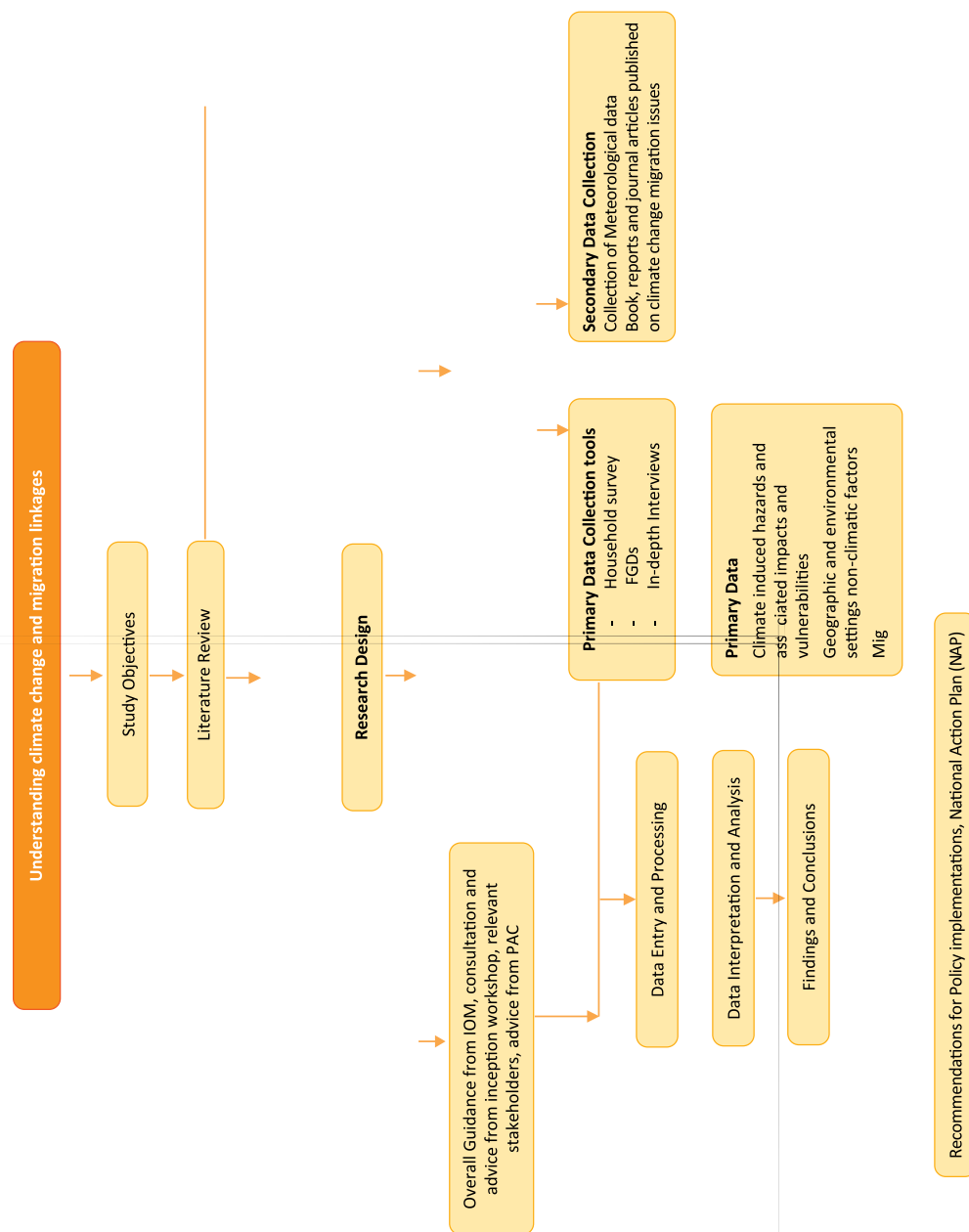
Zahid, A. and S.R.U. Ahmed

- n.d. Groundwater Resources Development in Bangladesh: Contribution to Irrigation for Food Security and Constraints to Sustainability. Bangladesh Water Development Board, Dhaka. Available from <http://publications.iwmi.org/pdf/h039306.pdf>.

Zhou, M. and D. Braam

- 2015 Community Resilience and Disaster-Related Displacement in South Asia. Research paper. Norwegian Refugee Council, Oslo.

ANNEX I. OVERALL RESEARCH PLAN



ANNEX 2.

DRAFT PLANS OF ACTION

MODEL PLAN OF ACTION FOR MANAGEMENT OF MIGRATION IN THE CONTEXT OF CLIMATE CHANGE AND ENVIRONMENTAL DEGRADATION

Outline of the Act on Plan

1. Background/Rationale
2. Brief overview on the relevant national policy that directly/indirectly addresses migration issues
3. Model Plan of Action
 - 3.1. Strategic Objectives
 - 3.1.1. To strengthen the policy and institutional framework for the effective management of migration in the context of climate change and environmental degradation
 - 3.1.2. To establish climate change and environmental migration monitoring and support services system
 - 3.1.3. To facilitate effective internal and international migration primarily from areas vulnerable to climate change and environmental degradation
 - 3.1.4. To strengthen capacity of the relevant stakeholders at different levels to facilitate effective migration from areas prone to climate change and environmental degradation
 - 3.1.5. To facilitate implementation of appropriate programmes as part of migration management at origin (research and implementation)
 - 3.2. Priority Actions Matrix

MODEL PLAN OF ACTION FOR MANAGEMENT OF MIGRATION INDUCED BY CLIMATE CHANGE AND ENVIRONMENTAL DEGRADATION

I. BACKGROUND AND RATIONALE

Climate change will have major environmental, social and economic impacts, particularly in developing countries (Vasquez, 2015; Ahmad, 2016). Since the 1900s, the Earth's temperature has increased by 0.7°C and is predicted to rise by a total of 2–3°C within the next half century if action is not taken to reduce greenhouse gas emissions (Stern, 2007). Such increases in global atmospheric temperatures accelerate the pace of climate change, resulting in temperature extremes, rises in sea-level, salinity intrusion, increases in the frequency and severity of droughts, floods and tropical storms as well as more unpredictable weather (Otzelberger, 2014). IPCC indicates that the rate of SLR was 1.7 mm/year during 1901–2010 while it was 3.2 mm/year during 1993–2010 (IPCC, 2013). It also reveals that the rate of SLR might increase further from 8 to 16 mm/year between 2081–2100 (IPCC, 2013). In this way, climate change will adversely alter the “nature of the climate hazards, people and ecosystems are exposed to” (Oppenheimer et al., 2014: p:1051).

In Bangladesh, climatic hazards such as floods (riverine floods, flash floods, coastal floods), droughts, cyclones and storm surges, SLR, salinity intrusion in water and soil, variation in temperature and rainfall directly and indirectly affect the people of Bangladesh (BCCSAP, 2009; IOM, 2010; Rabbani et al., 2015; Huq and Rabbani, 2011). The lives and livelihoods of the majority of the people, especially in the rural areas of Bangladesh primarily depend on the access and use of key environmental resources including land and water. The above-mentioned climatic hazards affect these vital resources triggering the reduction of proper functions and services to the people. In combination with non-climatic factors such as poverty, increased density of population, political pressure, many are left with no option but to migrate. Studies show that the decision to migrate is highly complex and it is prompted by a number of social, economic, political and environmental factors (Foresight, 2011; Jager et al., 2009 in ADB, 2012). In Bangladesh, degradation of natural resources and lack of livelihood opportunities push many people to migrate internally (Planning Commission, 2015). Displacement due to sudden-onset events is also frequent: UNOCHA (n.d.) states that Cyclone Sidr and floods displaced nearly 4.4 million and Cyclone Aila displaced about 2 million coastal people in 2007 and 2009 respectively. These two disasters affected at least 14 million people in 20 districts (Rahman, 2010; Shelter Project, 2009). IOM indicates (2010) that, river bank erosion is expected to displace huge numbers of people living on the banks of the Jamuna, the Ganges and Padma rivers, while the IDMC (2015) report foresees the displacement of people in Bangladesh as a result of rising sea-levels. This indicates that the coastal zone might be the most vulnerable area due to climate change and millions of people are under threat of forced migration.

Many scientists, researchers and practitioners argue that migration should be considered as an adaptation option. Azam and Falk (2013) state that “.... it is more appropriate and authentic to term migration as a transformational livelihood adaptation strategy to support resilience...”. While Martin et al., (2013) support this argument by saying “Migration as an adaptation covers a spectrum of motives and outcomes—from moving out of an area of risk exposure (Adger et al., 2005), surviving bad times and helping in disaster recovery and improving and diversifying livelihood when faced with soil degradation and erratic rainfall (Tacoli 2011)”. In fact, many others believe and suggest that migration offsets the impacts and vulnerability to environmental hazards (McLeman and Smit, 2006; Barnett and Webber, 2009; Foresight, 2011; ADB, 2012).

Regarding effective management of migration flow, Siddiqui (2016) suggests improved migration governance in the country. Some other researchers mention that national policy framework is needed to address environmental and climate migration in Bangladesh (Azam and Falk, 2013). Development of a migration policy should be prioritized to address both internal and international migration due to climate change and environmental shocks (Martin et al., 2013).

To address the challenges associated with climate change and consider migration as an adaptation strategy, it is necessary that the Government of Bangladesh develops an evidence based Model plan of action for migration management to ensure the affected people are protected. The IOM study (2016) conducted in four vulnerable districts in Bangladesh critically recommend to have a Model Plan of Model Plan of Action (PoA) on Migration to manage both internal and international migration mainly caused by climate change and environmental shocks and stresses.

2. BRIEF OVERVIEW ON THE RELEVANT NATIONAL POLICIES

A number of major climate change and disaster management policy and strategic documents of the Government of Bangladesh directly or indirectly refer to migration. This includes the National Adaptation Programmes of Action (NAPA, 2005), Bangladesh Climate Change Strategy and Action Plan (BCCSAP, 2009), Disaster Management Act 2013 and National Plan for Disaster Management 2010–2015. The recently developed Seventh Five Year Plan of the government also refers to migration. Although there is no specific national policy on migration in the context of climate change and environmental degradation, the Comprehensive Disaster Management Programme (CDMP) under the MoDMR of the Government of Bangladesh has developed a National Strategy on the Management of Disasters and Climate Induced Internal Displacement (NSMDCIID) in 2015. This mainly focuses on forced migration and recommends a set of actions in three major phases: (i) Pre-displacement; (ii) During displacement; and (iii) Post-displacement.

The following table indicates some Government of Bangladesh policy documents on climate change and how they address migration.

Table 1: Relevant policy documents in the context of migration, environment and climate change

Policy document	Year	Type of policy and how it reflects migration
Bangladesh Climate Change Strategy and Action Plan (BCCSAP)	2009	“A4. Assessment of climate change and its impacts on out-migration.” (page 56)
		“In the worst case scenario, unless existing coastal polders are strengthened and new ones built, sea-level rise could result in the displacement of millions of people – environmental refugees- from coastal regions, and have huge adverse impacts on the livelihoods and long-term health of a large proportion of the population”. (page 1 / Context 3)
National Adaptation Programmes of Action (NAPA)	2005	Intensity of impacts on different sectors due to climate change. (page 17 / Figure 7) “Social consequences of mass scale migration to cities would to some extent be halted.” (page 36 / Project No. 11)
Disaster Management Act	2012	Migration is not stated explicitly, but the act mentions rehabilitation as “If necessary, to transfer affected people in other region to resume natural way of living.” (Article 15 (C))
National Plan for Disaster Management 2010–2015	2010	“Additionally, the poor are more vulnerable to any kind of disaster due to a) depletion of assets, b) income erosion due to loss of employment, c) increased indebtedness and d) <u>outmigration</u> . Moreover, the cost to cope with disasters is disproportionately higher for the poor”.
National Strategy on the Management of Disasters and Climate Induced Internal Displacement	2015	The first policy to be developed solely focused on environmental migration. However it limits its scope to internal displacement only.

Source: extracted from the study report.

3. MODEL NATIONAL ACTION PLAN

The Government of Bangladesh, IOM and other UN Agencies, non-governmental organizations (NGOs), civil society organizations (CSOs), researchers, academics and development partners with the potential of climate change impacts on the country with great concern.

The Ministry of Environment and Forests (MOEF) led the development of the NAPA and BCCSAP to address climate change impacts. It also established the Climate Change Trust (CCT) to coordinate, communicate and implement the BCCSAP. The Ministry of Finance allocated about 400 Million USD in the last five years to implement the BCCSAP to reduce the vulnerability of the people. Development partners also provided additional support to government organizations, NGOs and private sectors for implementing adaptation and mitigation actions in the vulnerable areas especially in the coastal zone. However, migration due to climate change and environmental degradation did not get substantial

attention by any of the above-mentioned policy and investment. A study was conducted on “Trend and Impact Analysis of Internal Displacement due to the Impacts of Disaster and Climate Change” under the CDMP of MODMR. It also supported the preparation of the National Strategy on the Management of Disasters and Climate Induced Internal Displacement (NSMDCIID). This mainly addresses only forced migration, but not overall management of migration.

To complement the climate change strategy, development plan of the government and address existing gaps in other relevant policy documents, a “National Action Plan on Migration in the context of Climate Change and Environmental Degradation” is important. This model action plan proposes a number of actions under five strategic objectives based on the views and opinions of the affected communities and relevant experts. IOM also received feedback on the preliminary National Action Plan (NAP) from a range of stakeholders, including government officials especially from the Ministry of Environment and Forests, Ministry of Planning, Ministry of Local Government, Rural Development and Cooperatives, Ministry of Disaster Management and Relief, UN agencies and civil society representatives during a national level consultation workshop held on 26 October 2016. The following sections provide a comprehensive action plan under five strategic objectives.

3.1. STRATEGIC OBJECTIVES

3.1.1. To strengthen the policy and institutional framework for the effective management of migration in the context of climate change and environmental degradation

Priority Actions:

- i. Establish a “National Committee on Climate and Environmental Migration Management” in Bangladesh.
- ii. Development of a “Climate and Environmental Migration and Relocation Policy”.
- iii. Establishment of Environmental Migration Wing at the Ministry of Expatriates’ Welfare and Overseas Employment.
- iv. Facilitate integration of environmental migration into relevant national policies/laws including Overseas Employment and Migration Act 2013 and Urban Development Plan for example, Dhaka Metropolitan Development Plan).
- v. Initiative for enforcement of current environment related laws (Water Act, 2013; Environment Conservation Act, Disaster Management Act and so on) to protect natural resources, vulnerable ecosystems as part of migration management.

3.1.2 To establish climate change and environmental migration monitoring and support services system

Priority Actions:

- i. Establishment of migrant resource and monitoring centre (MRMC) at Union Parishad (UP), Pourashova and City Corporation level especially in areas that are vulnerable to climate change and with high outmigration.
- ii. Developing and updating a migration database for both international and internal migrants at the union level and also at the national level (men and women).

3.1.3 To facilitate effective internal and international migration primarily from areas vulnerable to climate change and environmental degradation

Priority Actions:

- i. Strengthen bilateral negotiation with developed countries to facilitate international migration and relocation from climate vulnerable locations in Bangladesh.
- ii. Develop specific mechanism to facilitate both internal and international migration from climate prone areas. (For example, reserve quota for international migration from climate change vulnerable areas. This was done for *Monga*¹ affected area. Four per cent quota was reserved for migrants originating from Monga affected areas.)
- iii. Immediate response system and resource centre for migration and relocation.

3.1.4 To strengthen capacity of the relevant stakeholders at different levels to facilitate effective migration from areas prone to climate change and environmental degradation

Priority Actions:

- i. Training/curriculum to assist affected communities adapt to a changing climate by incorporating new techniques and technologies in resource-based occupations and on other themes such as financial literacy/planning.
- ii. Skills development for potential migrants so that they can acquire decent jobs in the destination regions.
- iii. Capacity-building of high-level policymakers including government officials, policymakers, development partners on the issue of environmental migration.
- iv. Training of field level public administration in both area of origin and area of destination.
- v. Advocacy initiative to counter the negative narrative associated with internal migration.
- vi. Awareness raising in areas with high outmigration about safe and orderly migration to reduce the risk of irregular migration, trafficking and smuggling.

3.1.5 To facilitate implementation of appropriate programmes as part of migration management at origin (Research and implementation)

- i. Creation of alternate livelihood options or employment opportunities, along with skills development in poverty stricken, climate change affected areas.
- ii. Provide context specific low cost technological options especially in agriculture and water supply options.
- iii. Research with wider geographical areas (with large sample size) on further relationship and significance between migration, environment and climate change, and on spending patterns of remittances received to determine the conditions necessary for migration as an adaptation strategy.
- iv. Advocacy to increase public spending on health and education on areas of origin experiencing environmental migration.

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Monga is a Bengali term referring to the yearly cyclical phenomenon of poverty and hunger in Bangladesh.

- v. Research on social safety net coverage to the vulnerable population in areas of origin experiencing environmental migration.
- vi. Programmes and projects need to be initiated to protect natural resources, low lying areas, agricultural fields and water resources.

3.2. PRIORITY ACTION MATRIX

Model National Action Plan for Management of Migration Induced by Climate Change and Environmental Degradation

Overall Goal	Description of the overall goal The overall goal would be to manage internal and external migration in the context of climate change and environmental degradation in Bangladesh through improved national and local governance, institutional coordination and effective implementation of planned actions.			
Specific Objective 1	Description of the objective <i>To strengthen the policy and institutional framework for the effective management of migration in the context of climate change and environmental degradation</i>			
	Description of the activity	Stakeholders involved in the activity	Proposed timeframe for the activity	Remarks
Activity 1	Establish a “National Committee on Climate and Environmental Migration Management” in Bangladesh.	Main stakeholders: local government, MoEF and MoEWOE, NGO, INGO and academia	Immediate (within 1 year)	
Activity 2	Development of a “Climate and Environmental Migration and Relocation Policy”.	Relevant stakeholders	Mid-Term (2–3 years)	Policy should include action plan
Activity 3	Establishment of Environmental Migration Wing at the Ministry of Expatriates’ Welfare and Overseas Employment.			<ul style="list-style-type: none"> - The national consultation agreed to have a wing but needs to be based on institutional mandate and rules of business - MoEWOE only deals with international migration.
Activity 4	Facilitate integration of environmental migration into relevant national policies/ laws including Overseas Employment and Migration Act 2013 and Urban Development Plan for example, Dhaka Metropolitan Development Plan).			This activity should focus on internal population management, city/urban planning adaptation in vulnerable districts

Activity 5	Initiative for enforcement of current environment related laws (Water Act, 2013; Environment Conservation Act, Disaster Management Act and so on) to protect natural resources, vulnerable ecosystems as part of migration management			Suggested to have an initiative which can immediately take actions rather than having policy level dialogue
Objective 2	To establish climate change and environmental migration monitoring and support services system			
	Description of the activity	Stakeholders involved in the activity	Proposed timeframe for the activity and outcome	Remarks
Activity 1	Establishment of migrant resource and monitoring centre (MRMC) at Union Parishad (UP), Pourashove and City Corporation level especially in areas that are vulnerable to climate change and with high outmigration.	UDMC, Union info centre, A2i, MoEF	immediate	
Activity 2	Developing and updating a migration database for both international and internal migrants at the union level (men and women).	MOEF, MEDE Private sector can be potential partner, MoP	immediate	Gender disaggregated data needs to be ensured
Objective 3	To facilitate effective internal and international migration primarily from areas vulnerable to climate change and environmental degradation			
	Description of the activity	Stakeholders involved in the activity	Proposed timeframe for the activity and outcome	Remarks
Activity 1	Strengthen bilateral negotiation with developed countries to facilitate international migration and relocation from climate vulnerable locations in Bangladesh.	MoFA, MoL, IOM, MoEWOE, MoDMR, BBS, UNHCR, IPCC India, Myanmar and Middle East	Long-Term (more than 3 years)	
Activity 2	Develop specific mechanism to facilitate both internal and international migration from climate prone areas (For example, reserve quota for international migration from climate change vulnerable areas. This was done for <i>Monga</i> ¹ affected area. 4% quota was reserved for migrants originating from Monga affected areas.)	National level: MoDMR, MoEWOE, MoFA, YPSA Global level: Follow up to the Nansen Initiative and Peninsula Principles on Climate Displacement within States	Long-Term (more than 3 years)	Strength national social safety net
Activity 3	Immediate response system and resource centre for migration and relocation.	UNDP, UNHCR, UNEP, NGO, MoICT, MoI		
Strategic Objective 4	To strengthen capacity of the relevant stakeholders at different levels to facilitate effective migration from areas prone to climate change and environmental degradation			

	Description of the activity	Stakeholders involved in the activity	Proposed timeframe for the activity and outcome	Remarks
Activity 1	Training/curriculum to assist affected communities adapt to a changing climate by incorporating new techniques and technologies in resource-based occupations and on other themes such as financial literacy/planning.	Main stakeholders: MoA, MoF, MoEF, MoL, NGOs, Research Institution and local communities	Immediate (within 1 year)	
Activity 2	Skills development for potential migrants so that they can acquire decent jobs in the destination regions.	Main stakeholders: MoE, MoYS, MoI, MoSW, government vocational training institute and local community	Mid-Term (2–3 years)	
Activity 3	Capacity building of high level policymakers including government officials, policymakers, development partners on the issue of environmental migration.	Government officials, policymakers, development partners, think tank and research institution	Long-Term (more than 3 years)	
Activity 4	Training of field level public administration in both area of origin and area of destination.	Bangladesh Public Administration Training Centre (BPATC)	Mid-Term (2–3 years)	
Activity 5	Advocacy initiative to counter the negative narrative associated with internal migration.	Main stakeholders: NGOs, Prime Minister's Office		
Activity 6	Awareness raising in areas with high outmigration about safe and orderly migration to reduce the risk of irregular migration, trafficking and smuggling.	- Local NGOs	Immediate to mid term (within 1 year)	
Strategic Objective 5	To facilitate implementation of appropriate programmes as part of migration management at origin (research and implementation).			
	Description of the activity	Stakeholders involved in the activity	Proposed timeframe for the activity and outcome	Remarks
Activity 1	Creation of alternate livelihood options or employment opportunities, along with skills development in poverty stricken, climate change affected areas.	Main stakeholders: NGOs, local government, Government of Bangladesh, MoY, TTC, CSOs	Mid-Term (2–3 years)	

Activity 2	Provide context specific low cost technological options especially in agriculture and water supply options.	Main stakeholders: DAE, MFIs, SME	Short, medium and long- term	
Activity 3	Research with wider geographical areas (with large sample size) on further relationship and significance between migration, environment and climate change, and on spending patterns of remittances received to determine the conditions necessary for migration as an adaptation strategy.	Main stakeholders: academia, researchers, MoEF, MoDMR, MoP, MoE	Immediate (within 1 year)	
Activity 4	Advocacy to increase public spending on health and education on areas of origin experiencing environmental migration.	Main stakeholders: government, NGOs, INGOs, CSOs	Long-Term (more than 3 years)	
Activity 5	Research on social safety net coverage to the vulnerable population in areas of origin experiencing environmental migration.	Main stakeholders: LGED, MoSW, MoWCA	Immediate (within 1 year)	
Activity 6	Programmes and projects need to be initiated to protect natural resources, low lying areas, agricultural fields and water resources.	Main stakeholders: MoEF, MoDMR, MoP, NGOs, INGOs	Long-Term (more than 3 years)	

REFERENCES

Adger, W.N., N.E. Arnelland and E.L. Tompkins

2005 Successful adaptation to climate change across scales. *Global Environ.Chang.*, 15, 77–86.

Ahmad, Q.K.

2016 Addressing poverty, inequality and climate change. *The Daily Star*. 4 February.

Azam, M. and G.C. Falk

2013 Governance of Climate Induced Migration in the Coastal regions of Bangladesh: New Transformation Required? Accessed on 14 November 2016. Available from <http://tokyo2013.earthsystemgovernance.org/wp-content/uploads/2013/01/0268-AZAM.pdf>

Barnett, J. and M. Webber

2009 Accommodating Migration to Promote Adaptation to Climate Change, Stockholm: Commission on Climate Change and Development.

BCCSAP

2009 Bangladesh Climate Change Strategy and Action Plan. Ministry of Environment and Forests, Government of the People's Republic of Bangladesh.

Foresight

2011 Migration and Global Environmental Change, Final Project Report. The Government Office for Science, London.

Huq, S. and G. Rabbani

2011 Climate change and Bangladesh: policy and institutional development to reduce vulnerability. *Journal of Bangladesh Studies*. 13, pp. 1–10.

IOM

2010 Assessing the Evidence: Environment, Climate Change and Migration in Bangladesh. International Organization for Migration, Dhaka, Bangladesh.

IPCC

2013 Summary for Policymakers. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, United States of America.

Jäger, J., J. Fröhmann, S. Grünberger and A.Vag

2009 EACH-FOR synthesis report. Budapest: EACH-FOR. In *Climate Change and Migration in Asia and the Pacific*. Asian Development Bank. 2012.

Martin, M., Y.H. Yi Hyun Kang, M. Billah, T. Siddiqui, R. Black and D. Kniveton

- 2013 Policy analysis: Climate change and migration Bangladesh. Working paper 4, An output of research on climate change related migration in Bangladesh, conducted by Refugee and Migratory Movements Research Unit (RMMRU), University of Dhaka, and Sussex Centre for Migration Research (SCMR), University of Sussex.

McLeman, R. and B. Smit

- 2006 Migration as an adaptation to climate change.' *Climatic Change* 76: 31–53.

NAPA

- 2005 National Adaptation Programmes of Action. Ministry of Environment and Forests, Government of Bangladesh.

Oppenheimer, M. Campos R. Warren J. Birkmann G. Luber B. O'Neill and K. Takahashi

- 2014 Emergent Risks and Key Vulnerabilities. In: C.B. Field, V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilar, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Birma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea and L.L. White (eds.). *Climate Change 2014: Impacts, Adaptation and Vulnerability - Contributions of the Working Group II to the Fifth Assessment Report*. Cambridge, United Kingdom: Cambridge University Press, pp. 1039–1099.

Otzelberger, A.

- 2014 *Tackling the Double Injustice of Climate Change and Gender Inequality*. CARE International.

Planning Commission

- 2015 Sixth Five-Year Plan. Ministry of Planning, Government of the People's Republic of Bangladesh.

Rabbani, M.G., A.A. Rahman, I.J. Shoef and Z.M. Khan

- 2015 Climate Change and Food Security in Vulnerable Coastal Zones of Bangladesh. In: U. Habiba, M.A. Abedin, A.W.R. Hassan and R. Shaw (eds.). *Food Security and Risk Reduction in Bangladesh*. Tokyo: Springer, pp. 173–186.

Rahman, M.R.

- 2010 Impact of Riverbank Erosion Hazard in the Jamuna Floodplain Areas in Bangladesh, *Journal of Science Foundation*, 8(1–2):59.

Shelter Project

- 2009 Bangladesh 2009 – Cyclone Aila. Available from www.sheltercasestudies.org/shelterprojects2009/ref/B.1-Bangladesh-2009-Cyclone-Aila.pdf

Stern, N.

- 2007 *The Economics of Climate Change: The Stern Review*. Cambridge, United Kingdom: Cambridge University Press.

Siddiqui, T.

- 2016 International labour migration, published the Daily Star. Available from www.thedailystar.net/supplements/25th-anniversary-special-part-5/international-labour-migration-212671.

Tacoli, C.

- 2011 Not only climate change: mobility, vulnerability and Socioeconomic transformations in environmentally fragile areas in Bolivia, Senegal and Tanzania. London: International Institute for Environmental and Development (IIED).
- 2009. Crisis or adaptation? Migration and climate change in a context of high mobility. *Environment and Urbanization*. 21, p513-525.

Vásquez, G.C.

- 2015 Indigenous People and Climate Change: Causes of Flooding in the Bolivian Amazon and Consequences for the Indigenous Population. In: G.C.D. Ramos (ed.). *Inequality and Climate Change: Perspectives from the South*. Dakar: Council for the Development of Social Science Research in Africa (CODESRIA), pp. 121–136.

MALDIVES - DRAFT PLAN OF ACTION FOR ADVOCACY ON LINKS BETWEEN POPULATION MOVEMENT, CLIMATE CHANGE AND ENVIRONMENTAL DEGRADATION

I. BACKGROUND AND RATIONALE

The Maldives encompasses an area of roughly 107,500 square kilometres, making it the smallest country in South Asia (Zahid, 2011). The width of its island chain varies from 80 to 120 kilometres from west to east² and it has an average estimated elevation of 1.5 metres above sea-level (Shaig, 2008). However, over the years it is expected that 80 percent of the islands will decrease to less than 1 metre above sea-level. As such, rising sea-levels are considered to be one of the country's most vulnerable predicted consequences to climate change. The Maldives climate change policy framework was launched on the 10 of August 2015 and aims to improve climate change and development for the Maldives, as well as to strengthen the use of such information and knowledge in decision-making. The climate change policy encompasses the following five goals:

- 1) Ensure and integrate sustainable financing in climate change adaptation opportunities and low emission development measures;
- 2) Strengthen a low emission development future and ensure energy security for the Maldives;
- 3) Strengthen adaptation actions and opportunities and build climate resilient infrastructure and communities to address current and future vulnerabilities;
- 4) Inculcate national, regional and international climate change advocacy roles in leading the international negotiations and awareness in cross-sectorial areas in favour of the most vulnerable and small island developing States;
- 5) Foster sustainable development while ensuring security, economic sustainability and sovereignty from the negative consequences of the changing climate.

The Government of the Maldives noted in its 2009 National Adaptation Programme of Action (NAPA) that it had adopted the programme "to address the challenges experienced by environmentally vulnerable islands, that are currently experiencing severe impacts from climate change and associated sea-level rise, due to the remote and dispersed population" (Mayer, 2011). While moving large populations on less inhabited islands will increase the safety of the population, adaptation remains a very great challenge in the Maldives as a whole (Mayer, 2011). As such, housing and infrastructure development programs are undertaken to incentivize people from smaller communities to move to bigger and more spacious islands with larger populations and ability to better provide necessary facilities. Like other adaptation strategies, planned relocation and human mobility is a way for communities to cope with changes in environmental conditions.

As an outcome of the climate change policy and in relation to the Cancun Adaptation Framework, a new National Adaptation Plan is being developed which will pave the way for more focused adaptation measures to be undertaken in the most vulnerable islands of the Maldives. Related to this, the President of the Maldives has also ratified the Disaster Management Act on 6 September 2015. (Ref: 2015-338). Article 7.1 of the Act states the following: 7. (1) For the purposes of this Act, an Atoll Disaster Management Authority has to be established, and an Island Disaster Management Authority in all atolls and inhabited islands of the country.³ The Act states that every island will develop a disaster management plan. Under this disaster management plan, island risk assessments relating to processes, such as sea-level rise, will be undertaken in the future.

Research shows that at the global and regional level, the impact of climate change on small developing islands has been highly discussed.

However, translating the global and regional discussion and commitments of these countries into action at the national and community level is still a challenge. The realities of people currently affected by climate change and environment degradation are not fully taken into account while designing policies and strategies. This results in a one-way, linear transfer of knowledge from the central level to people living in the islands, whereby these people in communities are imagined as having little awareness of climate change and environmental factors, and as such, are lacking interest in responding to emerging challenges (Arnall and Kothari, 2015). This plan of action focuses on advocating for climate change at different tiers of the government and the community. Some of the activities include, but are not limited to, capacity building, policy development, awareness raising, and evidence-based policy making for effective advocacy and reforms for climate change and migration issues.

2. STRATEGIC GOALS AND OBJECTIVES

The overall goal of this national act on plan is as follows

To advocate for effective climate change adaptation strategies related to population movement in order to increase awareness among policymakers, government institutions, and communities.

The strategic objectives are:

- 1) To clearly define the roles of government institutions, agencies and communities to strengthen their capacity to implement climate change adaptation measures;
- 2) To design advocacy strategies for awareness raising on the impacts of climate change in vulnerable low lying island communities and population movement at the island, atoll and national level;
- 3) To build capacity in Government agencies, NGOs and Community-Based Organizations (CBOs) at the national and local level on raising awareness on adaptation measures at the community level and the science of climate change and its impacts;

3

Disaster management act 2006 Republic of Maldives accessed on 10 March 2016. Available from www.ifrc.org/Docs/idrl/880EN.pdf.

- 4) To identify and incorporate best adaptation practices from the Maldives and other Small Island Development States (SIDS) to mainstream climate change adaptation and population movement into the existing mechanisms and development plans at the national and island level;
- 5) To identify and recommend best practice approaches in the Maldives regarding awareness raising materials to be undertaken utilizing the media to advocate for adaptation strategies;
- 6) To advocate for policy reform and strengthen the legislative framework in the areas of climate change, environmental degradation and issues faced at the national/local level due to relocation and the movement of populations; and
- 7) To advocate for empirical research in assessing the islands and impacts of climate change and adaptation measures and its link to population movement at the different administrative tiers.

3. COORDINATION AND IMPLEMENTATION ARRANGEMENTS

The implementation of the Plan of Action involves multi-stakeholder coordination which will be ensured through the national coordinating committee chaired rotationally by relevant line ministries. Coordination and cross-synergies have been pointed out as one of the areas that need to be strengthened at multiple levels, both within and outside the government and among other climate change actors, to help avoid duplication of efforts and assist in pooling available resources. Coordination needs be both horizontal (e.g. among ministries and departments) and vertical (e.g., between government, NGOs and business). However, this horizontal and vertical coordination through the government remains a challenge in the Maldives.

The focal Government agencies include the Ministry of Environment and Energy, Disaster Management Authority, Ministry of Housing, Ministry of Education, and Ministry of Health. These agencies are supported by the Local Government Authority, Atoll and Island councils and other non-governmental organizations. The role of the focal Ministries and departments will be to ensure that effective coordination, policy reform, and strengthened governance mechanisms are brought about with regard to sustainable climate change adaptation measures at the island, atoll, and national level, specifically in relation to human mobility and population movement. The national coordination committee will also ensure that resources to implement these measures are secured by using a multi-pronged approach: through private and public funding sources and by mobilizing external donors.

A monitoring and evaluation (M&E) system and guidelines are required to implement the Plan of Action (POA) in an effective and impactful manner. Easy-to-follow guidelines are required to be developed to monitor, review, evaluate and report on national action plans for climate change adaptation strategies related to population movement in order to increase awareness among policymakers and government institutions. The M&E matrix will be designed to promote and strengthen advocacy on climate change and population movement related to human mobility issues. This document takes into account the implementation experiences, learning, feedback and information on results and lessons learned by the government and non-government implementing agencies. This information is expected to feedback into the information cycle to inform and influence decision-making on policies, strategies for implementation and to improve knowledge and performance on the above mentioned issues.

4. FUNCTIONAL DEFINITION

For the purposes of the Plan of Action (POA), the definitions of key concepts are elaborated below. The objective of the functional definition is to ensure a standardized understanding of key terminologies and its linkages to climate change and environment degradation.

Population Movement: The movement of a person or a group of persons, either across an international border, or within a country. It encompasses any kind of movement of people, whatever its length, composition and causes; it includes migration of refugees, displaced persons, economic migrants, and persons moving for other purposes, including family reunification. This includes the status of any person who is moving or has moved across an international border or within a State away from his/her habitual place of residence, regardless of: (1) the person's legal status; (2) whether the movement is voluntary or involuntary; (3) what the causes for the movement are; or (4) what the length of the stay is.⁴

Orderly movement of people: The movement of a person from his or her usual place of residence to a new place of residence, in keeping with the laws and regulations governing exit of the country of origin and travel, transit and entry into the destination or host country.⁵

Climate change: A change in the climate that persists for decades or longer arising from either natural causes or human activities.⁶

Environmental Degradation: The reduction of the capacity of the environment to meet social and ecological objectives and needs.⁷

5. CONCLUSION

The Government of Maldives has acknowledged the importance of developing a comprehensive policy framework on climate change and environment degradation to guide related activities that take into account the national legislative framework, various development plans, strategies, action plans and on-going government and non-government initiatives. The Government of Maldives has identified eight principles in the Maldives Climate Change Policy Framework namely: climate leadership, intergenerational equitability, mainstreaming climate change, relevant international commitments, multinational partnerships, transfers of technology, and climate resiliency. Under these defined deliverables to develop and implement strategic priorities for the Maldives, the policy framework provides guidance to the development of a national plan of action.

The PoA at the national level developed through evidence based research and a comprehensive process of consultation including a literature review and atolls and island level consultations takes into account the prioritization of strengthening advocacy for increased awareness on the nexus between climate change, environmental degradation and population movement among the communities and the respective tiers of the government. It also integrates the aspect of increased awareness and robust advocacy

4 International Organization for Migration, www.iom.int/key-migration-terms, (accessed on 8 June 2016)

5 International Organization for Migration, www.iom.int/key-migration-terms, (accessed on 8 June 2016)

6 IOM Issue in Brief, Human Rights, Climate Change, Environment Degradation, and Migration : A New Paradigm, March 2014, Issue No. 8; Intergovernmental Panel on Climate Change, 1990.

7 IOM Issue in Brief, Human Rights, Climate Change, Environment Degradation, and Migration : A New Paradigm, March 2014, Issue No. 8; UNISDR Terminology on Disaster Risk Reduction, 2009.

into sectoral policies, plans and government mechanisms to foster climate-resilient communities and islands. As such, the PoA has been developed in-line with the *Policy Goal 4: Inculcate national, regional, and international climate change advocacy role in leading international negotiations and awareness in cross-sectoral areas in favor of the most vulnerable and small islands development states under the Climate Change Policy framework* endorsed by the Government of Maldives in August 2015.

Given the current gap in national climate change initiatives and local level knowledge, this current PoA has been developed with a specific focus on advocacy and awareness raising. The national action plan also recognizes the need to build a strong governance structure by building capacity of all the line ministries, civil society and other related national and international agencies. The Ministry of Environment and Energy (MEE) under this action plan has been identified as a leading government agency as it is also leading the National Adaptation Plan (NAP) formulation process in Maldives. Other key government and non-government stakeholders have been identified in the implementation of the plan of action.

Objective 1	To clearly define the roles of government institutions, agencies and communities to strengthen their capacity to implement climate change adaptation measures					
	Government institutions, agencies and communities have a clearer understanding of their roles in implementing climate change adaptation					
Output						
Activities	Target	Prioritization of activities (immediate, mid-term, and long-term)	Relevant Agencies	Core and Secondary Funding Source	Relevant initiatives and policy documents	
1.1. Conduct needs assessment of the current gaps and challenges in existing policies.	Compile a baseline study on the needs assessment of the current gaps and existing policies	Immediate (within 6 months)	The President's Office and Ministry of Environment and Energy			
1.2. Develop National framework for the action plan to addresses short, medium and long-term climate induced migration/relocation (population movement) at the national level.	A national framework and plan of action developed	Immediate (within 6 months)	The President's Office and Ministry of Environment and Energy			
1.3. Develop a comprehensive advocacy strategy for the implementation of the national plan aligned to the international commitments made by the Maldives and national initiatives/commitments.	An advocacy strategy developed to implement the national plan	Immediate and Mid-term (6 months–1 year)	The President's Office and Ministry of Environment and Energy		If there are existing frameworks in Government development agenda and policies, ensure these are in line with the strategy.	
1.4. Conduct capacity needs assessment to understand the existing capacity, legal and structural framework and the capacity needs.	XX number of personnel at the governance level and NGO and CBO oriented on their roles in implementing the national plan	Mid-term (2 years)	Ministry of Finance and Treasury (National Statistics Bureau) and National Disaster Management Centre			

Objective 2	To design advocacy strategies for awareness raising on the impacts of climate change in vulnerable low lying island communities and population movement at the island, atoll and national level					
	Enhanced coordination and understanding of human mobility issues, population movement and its link to environmental impacts amongst the ministries at the national, atoll and local island level					
Output						
Activities	Target	Prioritization of activities (immediate, mid-term, and long-term)	Relevant implementing agencies	Core and secondary funding source	Relevant initiatives and policy documents	
2.1. Incorporate the coordinating committee into current Climate change and sustainable development advisory body at national level to advocate for climate change issues.	Strengthen within 6 months to 1 year	Immediate (6 months–1 year)	Ministry of Environment and Energy, President's Office		New climate change policy framework by Government of Maldives in 2015	
2.2. Support the committee to design advocacy and awareness raising strategies based on the gaps and challenges identifies the current initiatives and capacities.	1 year	Mid-term (1 year)	Ministry of Environment and Energy and National Advisory Body on Climate Change			
2.3. The committee to design, create, and develop the capacity of networks and stakeholders group at the community level to become advocates on climate change.	2–5 years	Mid and long-term (2–5 years)	Ministry of Environment and Energy and National Advisory Body on Climate Change			
2.4. Build capacity of the committee, strengthen the existing framework, and review the committee.	2–5 years	Mid and long term (2–5 years)	Ministry of Environment and Energy, National Climate Change Advisory Body, and President's Office			
2.5. Support and strengthen the activities of Climate Change National Committee. Build technical capacity building of the committee.	2–5 years	Mid and long term (2–5 years)	UNDP and National Climate Change and Sustainable development advisory body			

Objective 3	To capacitate Government agencies, NGOs and CBOs at the national and local level on raising awareness on adaptation measures at the community level and the science of climate change and its impacts					
Output	Identified stakeholders have increased capacity to undertake climate change adaptation measures					
Activities	Target	Prioritization of activities (immediate, mid-term, and long-term)	Relevant agencies	Core and secondary funding source	Relevant initiatives and policy documents	
3.1. Conduct resource assessment and capacity needs assessment at the national and local level.	One assessment report on resource mapping and capacity	Immediate (within 6 months)	Ministry of Environment and Energy (MEE), Local Government Authority and other CBOs			
3.2. Build capacity of government officials at all levels on impact of climate change, climate change adaptation, disaster risk reduction measures and population movement.	XX number of government officials at different levels trained	Mid and long term (1-5 years)	MEE , LGA and Maldives Meteorological Service			
3.3. Support National Disaster Management Centre (NDMC) to build capacity for comprehensive community response on climate change and mobility to build climate – resilient communities.	XX number of personnel government, NGO and CBO officials trained	Mid and long term (1-5 years)	MEE, NDMC, LGA, Ministry of Housing, UNDP, UNICEF and other European Partners,			
3.4. Build capacity of government and non-government agencies on relevant legislation such as the National Disaster Management Act and other policy documents, monitoring and evaluation, and documentation of lessons learned.	XX number of personnel government, NGOs and CBOs officials trained	Mid and long term (1-5 years)	MEE, Attorney General's office, NDMC, and CSOs			
3.5. Build the capacity of government and non-government agencies to conduct actual systematic vulnerability assessments, and document climate change impacts.	XX number of personnel government ,NGOs and CBOs trained	Mid and long term (1-5 years)	MEE, Ministry of Housing, Ministry of Finance, and CSOs			
3.6. Conduct awareness raising and advocacy campaigns on climate change, environmental degradation, and population movement at the national and island level	XX number of awareness raising and advocacy activities conducted	Mid and long term (1-5 years)	MEE, Ministry of Housing, LGA and CSOs			

Objective 4	To identify and incorporate best adaptation practices from Small Island Development States (SIDS) and the Maldives to mainstream climate change adaptation and population movement into the existing mechanisms and development plans at the national and island level				
Output	Existing mechanisms and development plans will be made more inclusive by incorporating relevant inputs by diverse stakeholder from the national to local level related to Climate change adaptation and population movement				
Activities	Target	Prioritization of activities (immediate, mid-term, and long-term)	Relevant agencies	Core and secondary funding Source	Relevant initiatives and policy documents
4.1. Identify and incorporate adaptation measures under the mobility framework from SIDS and Maldives into the LGA guiding document.	Adaptation measures identified from the SIDS and incorporated into the document	Immediate (6 months)	Ministry of Environment and Energy, LGA, Home Ministry,	Government	Climate change policy framework, Land use plan
4.2. Build capacity on awareness and advocacy of the adaptation measures at the local and community level.	XX number of awareness and advocacy campaigns held at the local and national level	Immediate and mid-term (6 months–2 year)	Ministry of Environment and Energy, LGA, Home Ministry,	Government	Climate change policy framework, NAPA
4.1. Identify and mainstream adaptation measures into the existing new national school curriculum.	Adaptation measures are incorporated into the respective subject areas	Mid and long term (2–5 years)	Ministry of Environment and Energy, National Institute of Education, CSO	Government	Climate change policy framework Education master plan
4.2. Build capacity of government and non-government agencies to advocate for incorporating adaptation measures in existing development plans of the Maldives.	XX number of personnel at the governance level and NGOs and CBOs trained to incorporate adaptation measures into island development plans	Mid and long term (2–5 years)	Local Government Authority, island Councils, Private parties, Housing Ministry	Government	Climate change policy framework, Land use plan

Objective 5	To identify and recommend best approaches in the Maldives regarding awareness raising materials to be undertaken utilizing the media to advocate for adaptation strategies					
	A comprehensive media strategy to advocate for climate change adaptation					
Output						
Activities	Target	Prioritization of activities (immediate, mid-term, and long-term)	Relevant agencies	Core and secondary funding source	Relevant initiatives and policy documents	
5.1. Identify the accessibility and interest of different media to different age cohorts in the population.	A survey designed and undertaken to identify the accessibility and interest of different medias	Immediate (6 months)	Environment Ministry, Media Council, CBO, NGO	Government		
5.2. Design a media campaign to be launched to spread awareness and advocate of climate change and its links to population movement issues.	Media campaign designed and launched	Immediate (1 year)	Environment, Media Council, CBO, NGO	Government		
5.3. Create and build capacity of campaign ambassadors (Government and non-Government) at the community and national level to advocate for measures to address climate change, environment degradation, and population movement.	XX number of personnel at the governance level and NGOs and CBOs trained to utilize the tools effectively	Mid-term (1–2 years)	Environment, Media Council, CBO, NGO	Government		
5.4. Publish articles and write up on climate change, environment degradation, and population movement.	XX no of articles published and uploaded on website	Mid and long-term (2–5 years)	Environment, Media Council, CBO, NGO	Government and Media council, CBO, NGO		

Objective 6	To advocate for policy reform and strengthen legislative framework in the areas of climate change, environment degradation and issues faced at the national/local level due to relocation and the movement of populations					
	Reformed policy and legislative framework that incorporate key issues related to relocation and movement of populations in the context of climate change are implemented					
Output	Activities	Target	Prioritization of activities (immediate, mid-term, and long-term)	Relevant agencies	Core and secondary funding source	Relevant initiatives and policy documents
<p>6.1. Undertake a mapping exercise where policies/ guidelines need to be developed /strengthened with regard to movement of people or relocation of communities (which includes after care and protecting the rights of the communities).</p> <p>6.2. Support policymakers in designing policies/guidelines in the areas identified in the above mapping exercise.</p> <p>6.3. Orient the parliamentarians, governance/judiciary plus NGO and CBO in the community, and atoll level in the new policies and guidelines.</p> <p>6.4. Strengthen institutional capacity in implementing revised policies/ guidelines.</p>		Gaps and challenges in the policies/guidelines are identified through a study	Immediate (1 year)	MEE, Ministry of Housing and, Ministry of Gender and Law		
		Policies and guidelines related to activity 6.1 will be identified	Mid and long-term (2–5 years)	MEE, Ministry of Housing and, Ministry of Gender and Law and, UN Agencies		
		XX number of personnel at the governance level and NGO and CBO trained to utilize the tools effectively	Mid and long-term (2–5 years)	MEE, Ministry of Housing and, Ministry of Gender and Law		
		Institutional mechanisms strengthened	Mid and long-term (2–5 years)	MEE, Ministry of Housing and, Ministry of Gender and Law		

Objective 7	To advocate for empirical research in assessing the islands and impacts of climate change and adaptation measures and its link to population movement at the different administrative tiers				
	Increased evidence on climate change vulnerability and impacts of adaptation measures				
Output					
Activities	Target	Prioritization of activities (immediate, mid-term, and long-term)	Relevant agencies	Core and secondary funding source	Relevant initiatives and policy documents
7.1. Train government officials at atoll and island levels on data collection and documentation.	X number of personnel trained	Immediate (1 year)	Environment Ministry, NDMA, LGA		
7.2. Empower the councils to use the evidence in advocating at the national level forums.	XX number of personnel at the governance level and NGO and CBO empowered to use the evidence to advocate for climate change	Mid and long-term (2–5 years)	Environment Ministry, NDMA, LGA		
7.3 To build capacity in the institute to undertake empirical research.	XX number of research done	Mid and long-term (2–5 years)	Environment Ministry, NDMA, LGA		

NEPAL – PLAN OF ACTION FOR MIGRATION, ENVIRONMENTAL DEGRADATION AND CLIMATE CHANGE

I. BACKGROUND

Nepal is one of the most vulnerable countries to climate change and environmental degradation. As the country is susceptible to various natural disasters, climate change related risks such as temperature rise and incessant rain, floods and landslides, droughts and thunderbolt, etc. are increasing in recent years, thus posing threats to people's livelihoods and increasing vulnerability of affected communities. Climate related hazards are coupled with the lack of livelihood opportunities. People living mostly in rural areas have become vulnerable to environmental shocks and stresses, and thus tend to migrate to safer places. Needless to say, migration has been considered as a way to counter vulnerabilities, which can often be seen as a positive adaptation strategy.

Despite the fact that Nepal has a long history of internal and external migration due to environmental and climatic reasons, environmental and climate migration has received relatively less attention amongst the development practitioners and policymakers in the country. In recent years, the complexities posed by climate change on vulnerable people has become an alarming issue. Hence, the nexus between migration, environment and climate change (MECC) is becoming a significant policy issue for Nepal.

A recent study conducted in 2015 by the International Organization for Migration (IOM) to assess the climate change, environmental degradation and migration nexus in Nepal has identified a lack of understanding/growing needs of environmental migrants with inadequate linkages between climate change, environmental degradation and migration nexus in Nepal. The study has also suggested the need to strengthen the capacity of line ministries (MoPE and the MoLE) by integrating MECC into agriculture, rural development, forestry, disaster management, climate change and migration policies; strengthening baseline information; mapping risks to migration and livelihoods; and conducting vulnerability and risk assessments. It has also called for creating an enabling legal and policy environment by integrating migration within the broader climate change framework, promoting community-led sustainable livelihood opportunities, adopting an inter-disciplinary and programmatic approach by integrating migration into climate change adaptation processes, harnessing available knowledge and know-how, and scaling-up proven technologies.

In order to address these impacts, the Government of Nepal formulated the Climate Change Policy (CCP) in 2011, which aims at improving people's livelihoods by mitigating and adapting to the adverse impacts of climate change, adopting a low carbon emission development path and implementing the commitments made in the national and international climate change related agreements. It has also identified priority

adaptation actions and called for the implementation of adaptation-related programmes that maximize benefits by enhancing positive impacts and mitigating adverse impacts. However, migration issues have not been incorporated into the policy.

The absence of migration related to climate change in the policy is primarily due to the low level of public awareness and understanding about the interrelationship between climate change and migration in Nepal, and how the latter can be a viable adaptation strategy. This is evident in the National Adaptation Programme of Action (NAPA), which although is a significant endeavor to determine immediate needs in responding to climate change through participatory means, it overlooks the possibility of migration and remittances in addressing future adaptation requirements of migrant sending households and origin communities.

In compliance with the requirement of the United Nations Framework Convention on Climate Change (UNFCCC) and as a major outcome of the Climate Change Policy (2011), the Government of Nepal has prepared the NAPA in 2010 which incorporates a multi-stakeholder approach by engaging relevant line ministries and departments. Since its formulation, the NAPA has been instrumental in main streaming climate change adaptation into Nepal's development planning process as it ensures the government's commitments to implement adaptation actions to address the needs of the vulnerable communities. Following the expert group guidance to ensure engagement and ownership of key line ministries, MoPE established six Thematic Working Groups (TWGs), each led by a different line ministry. These TWGs included: (i) agriculture and food security; (ii) forest and biodiversity; (iii) water resources and energy; (iv) climate-induced disasters; (v) public health; and (vi) urban settlements and infrastructure.

Based on the learnings from the NAPA formulation process, the MoPE has embarked on developing the National Adaptation Plan (NAP) in 2015 as called for in the UNFCCC. Led by MOPE, the NAP formulation process focusses on a multi-disciplinary and complementary approach that builds upon relevant existing plans and programmes with active coordination with the relevant organizations to provide a platform for discussion on technical subject matters, and address increasing risks and challenges induced by climate change.

Against this backdrop, in order to address the climate change-induced challenges and acknowledge migration as an adaptation strategy in Nepal, it is necessary that MoPE develop a realistic and implementable plan of action for migration management to protect the vulnerable communities. In this direction, IOM has recently conducted a study in Darchula district of Far Western Nepal that recognized the role of migration and strongly recommends to prepare a plan of action to manage both internal and external migration primarily caused by the impact of climate change and environmental shocks and stresses. Again, this plan of action has benefited immensely from the valuable inputs of relevant stakeholders present during the national consultative workshop held in Kathmandu on 1 June 2016. Hence, this plan of action for the management of migration induced by climate change and environmental degradation in Nepal serves as a guide to facilitate the integration of migration into the programmes and policies relevant in this regard.

2. STRATEGIC OBJECTIVES

The strategic objectives of the Plan of Action for the management of migration induced by climate change and environmental degradation in Nepal are:

- To increase the understanding of the relationship between climate change and the drivers of migration;
- To strengthen the capacity of relevant government line agencies and stakeholders at different levels in facilitating safer migration from areas prone to climate change and environmental degradation;
- To leverage migration as an adaptation strategy to climate change and extreme weather conditions; and
- To strengthen the legal, policy and institutional framework for effective management of migration in the context of climate change and environmental degradation.

3. COORDINATION AND IMPLEMENTATION ARRANGEMENTS

The NAP implementation involves multi-stakeholder coordination. This will be ensured through the NAP executive board chaired rotationally by the relevant line ministries. In order to coordinate and implement this action plan, the executive board may be entrusted to bring in key stakeholders to collaborate and promote an integrated effort towards mainstreaming migration into climate change, disaster management and environmental sectors and similarly mainstream these areas into migration governance. It may also provide guidance and oversight of the programmes identified by the plan of action.

4. MONITORING AND EVALUATION

Monitoring and evaluation of the plan of action is jointly led by MoPE and MoLE. An M&E framework will be developed built on the existing M&E guidelines of the National Planning Commission that monitors its own annual programmes through multilayered approach from national to local levels. A key priority of the M&E framework is to focus on monitoring and identifying problems in the implementation of the plan of action and resolving issues collectively through wider level stakeholder engagement. A logical framework is developed that outlines the priority activities of the action of plan through objectively verifiable indicators and a means of verification to measure the progress.

5. CONCLUSION

The Government of Nepal has acknowledged the importance of developing a national response to climate change and migration and is taking steps to harmonize policies issues. It has recognized the need to build a strong governance structure by strengthening amongst all the line ministries, civil society and other related national and international agencies. It has also realized limited knowledge, awareness and understanding on the nexus between climate change, environmental degradation and migration.

MoPE is leading the National Adaptation Plan (NAP) formulation process in Nepal. In this regard, MoPE, IOM and ICIMOD have agreed to work collectively on technical matters and advance the tasks in a spirit of mutual cooperation to initiate NAP formulation process in Nepal. The current support programme will strategically engage in assisting MoPE by providing technical backstopping in linking migration into the existing climate change policy interventions.

Draft Plan of Action for Migration, Environmental Degradation and Climate Change

Overall Goal Mainstream migration into Nepal's climate change policies	Description of the overall goal: Migration and climate change strategies and policies are well integrated at the national level by pursuing a wider, coordinated approach and building a strong evidence base to create informed policies and sensitize stakeholders to the benefits of linking migration with the existing climate change adaptation and disaster risk reduction policies.				
Strategic Objective 1	Description of the objective: <i>To increase the understanding of the relationship between climate change and the drivers of migration</i>				
	Description of the activity	Stakeholders involved in the activity	Means and resources (funding)	Proposed time-frame for the activity and outcome	Baseline/Target
Activity 1.1.	Raise understanding of the relationship between migration and climate change.	MoPE/MoLE/NGOs/development partners	Government/Non-Government Organizations and partners	June 2017	Need to review the current programmes and policies and find the gaps Need to identify which organizations are more relevant and update every six months
Activity 1.2.	Strengthen relevant line ministries to participate in integrating migration and climate change component through the establishment of networks.	MoPE/MoLE/NGOs/development partners	Government/Non-Government Organizations and partners	December 2017	List of networks Meet and influence 2/3 networks every year Nominate a core group of MoLE and MoPE as the focal agencies
Activity 1.3.	Organise dialogues/roundtable dialogues (media), seminars with the parliamentarians to sensitize them.	MoPE/MoLE/NGOs/development partners	Government/Non-Government Organizations and partners	June 2017	Need to be established Sensitize parliamentary committees on international Relations and Labour and Natural Resource Management
Activity 1.4.	Raise awareness of people through media in integrating migration and climate change component.	MoPE/MoLE/NGOs/development partners/media	Government/Non-Government Organizations/development partners and media	December 2017	Outreach and awareness raising programmes in areas of high out-migration on safer and orderly migration

Activity 1.5.	Strengthen local government organization to develop migration database.	MoPE/MoLE/MoFALD/NGOs/development partners	Government/Non-Government Organizations and partners	December 2017	Migration certificate should mention reason for migration
Strategic Objective 2	Description of the objective: <i>To strengthen the capacity of relevant government line agencies and stakeholders at different levels in facilitating safer migration from areas prone to climate change and environmental degradation</i>				
Activity 2.1.	Build capacity of government officials and policymakers and on environmental migration through training and workshop.	MoPE (lead), MoFALD, MoLD, MoLE, MoF, MoAD, MoHA, MoE, MoFSC, MoCTCA, NPC	MoPE, raise funds from bilateral and multilateral development partners	Six months after the finalization of Plan of Action	To be identified Central, State, Local
Activity 2.2.	Build capacity of Non State Actors on environmental migration through training and workshop.	Community Forest User Groups, Water User's Committees, Ward Citizen Forum	MoPE, raise funds from bilateral and multilateral development partners	One year after the finalization of Plan of Action	To be identified Central, State, Local
Activity 2.3.	Ensure effective inter-departmental and institutional coordination and ownership.	Establish MoPE as a Focal Point for communication and coordination	MoPE, raise funds from bilateral and multilateral development partners	One year after the finalization of the Plan of Action	To be identified Central, State, Local
Activity 2.4.	Introduce an incentive mechanism to encourage use of remittance in climate adaptation and resilience building.	MoPE, MoLE, MoF, MoFALD, MoLD, MoAD, MoHA	Matching fund Remittance	One year after the finalization of the Plan of Action	Allocate 2% of the remittance received by migrants
Activity 2.5.	Continuous knowledge building through research.	MoPE, MoLE, MoE, Central Bureau of Statistics, universities and research institutions	MoPE, raise funds from bilateral and multilateral development partners	One year after the finalization of the Plan of Action	Limited information Increase the intensity of research in generating more knowledge
Strategic Objective 3	Description of the objective: <i>To leverage migration as an adaptation strategy to climate change and extreme weather conditions</i>				
Activity 3.1.	Conduct stakeholder mapping exercise to determine the MECC nexus.	MoPE, MoLE, NPC and civil society organizations	Government/Non-Government Organizations and development partners	December 2016	Mapping exercise conducted
Activity 3.2.	Strengthen research in updating environmental migration database to better understand how remittance can help people build adaptive capacity in the face of climate change.	Department of Hydrology and Meteorology, Central Bureau of Statistics, MoAD, Nepal Rastra Bank, private sector and civil society	MoPE/DHM/BRCH, specialized agencies and development partners	June 2017	Production of a periodically updated database

Activity 3.3.	Recognize remittances as a source of funding for climate change adaptation and disaster risk reduction in national level strategies.	NRB, MoLE, MoPE, MoHA; local financial institutions, money transfer companies, banks and cooperatives	Donor agencies, individual means remittances; money transfer companies; ODA (Overseas Development Assistance)	June 2017	Limited information Entrepreneurship activities need to be developed
Activity 3.4.	Strengthen existing monitoring and response mechanism through differential approach in terms of how to support displaced HHs and HHs without access to remittance or who cannot migrate, etc.	MoHA, MoPE, MoAD (local level non-government organizations to facilitate the government) Vulnerability mapping to figure out migrant and non-migrant and what threats are posed to which people.	Government/ Non-Government Organizations and partners	December 2017	Increase the intensity of monitoring and response mechanism
Strategic Objective 4	Description of the objective: <i>To strengthen the legal, policy and institutional framework for effective management of migration in the context of climate change and environmental degradation</i>				
Activity 4.1.	Establish National MECC Committee within Climate Change Management Division (CCMD).	Taskforce co-led by Joint Secretaries of MoLE and MoPE with MoHA, MoFALD/DDC, NPC, MoWCSW (Provincial and State Governments) as members	Government/ Non-Government Organizations and partners	December 2016	MECC established
Activity 4.2.	Assess the impact of current climate variability and climate change on communities in urban and rural areas and Identify knowledge and policy gaps regarding the role of migration to build the adaptive capacity of the potential migrant and migrant households.	Government line ministries: MoPE, MoHA, MoFALD, MoLE Civil society (NGOs/CBOs/SHG, etc.), experts, scientific communities, academia, researcher, media, gender specialist	Government/ Non-Government Organizations and partners	June 2017	Need to carry out baseline information
Activity 4.3.	Recognize and integrate the role of migration and climate change in the upcoming development plans and policies.	NPC, MoPE, MoLE to formulate Annual Plan, Periodic Plan and comprehensive migration policy	Government/ Non-Government Organizations and partners	June 2018	MECC-friendly development plans and policies in place
Activity 4.4.	Initiate policy dialogues for the implementation of the existing environmental laws to conserve natural resources and vulnerable ecosystems as part of migration management.	Government line ministries: MoPE, MoHA, MoFALD, MoLE Civil society (NGOs/CBOs/SHG, etc.), experts, scientific communities, academia, researcher, media, gender specialist	Government/ Non-Government Organizations and partners	June 2016	Need to review existing policy frameworks linked to climate change and migration



Assessing the Climate Change Environmental Degradation and Migration Nexus in South Asia



IOM Development Fund
DEVELOPING CAPACITIES IN MIGRATION MANAGEMENT



International Organization for Migration (IOM)
The UN Migration Agency