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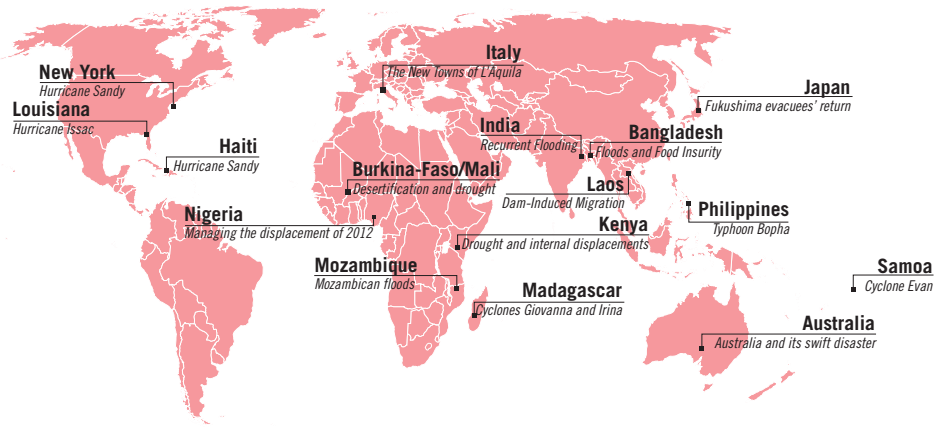
The State of Environmental Migration 2013

A REVIEW OF 2012

Edited by
François Gemenne
Pauline Brücker
Dina Ionesco



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with support of COST Action COST Action IS1101 on Climate change and Migration

COST IS1101 Climate change and migration: knowledge, law and policy and theory is a pan-European network of social scientists that aims to build a broad body of social science research on all aspects of climate change and migration. Our objectives are:

- to enhance and improve understanding of climate change and migration;
- to furnish state and non-state actors with state-of-the-art empirical, theoretical, legal and policy research on climate change and migration;
- to inform national and international policy dialogue, such as the IPCC and other policy initiatives;
- to expand research capacity in the area of climate change and migration; and
- to establish a network of Europe-based social science researchers working on climate change and migration.

Our work is subdivided into three working groups: Working Group I (WGI) - Knowledge; Working Group II (WGII) - Law and Policy; and Working Group III (WGIII) - Theory. The focus of WGI is empirical research, including method and data collection, quantification, remote sensing and geographical information systems, and modelling. The focus of WGII is normative research, including research leading to the development of policy and law. And the focus of WGIII is theoretical research, including political, cultural and social theory, postcolonial theory and critical race theory.

In order to achieve our objectives, we fund a range of activities including workshops, knowledge exchange, and research dissemination, such as the annual publication of the *State of Environmental Migration* report.

Our Action began in October 2011 and will run for 4 years, winding down in October 2015.

Dr Andrew Baldwin, Institute for Hazard, Risk, and Resilience, Durham University Chair, COST Action IS1101.

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INTRODUCTION

FRANÇOIS GEMENNE, PAULINE BRÜCKER AND DINA IONESCO

For the third consecutive year, the *State of Environmental Migration* is geared at bringing visibility to and new evidence on the migration-environment nexus. This third edition follows the same rationale as the two previous ones, giving space to young researchers to present a variety of case-studies on migration, environment and climate change. The *State of Environmental Migration* is an opportunity for young researchers to explore research on the matter and to propose policy recommendations.

As in the previous year, the publication has benefitted from the support of the COST Action IS1101 on Climate Change and Migration, a European-wide network of researchers working on the themes explored in the different chapters that follow. The Action puts a particular emphasis on the support to young researchers, and we are very grateful for the support offered this year again. The publication also owes a lot to Mark Koski, a graduate student from the University of Michigan. Mark did a fantastic editorial job on the different chapters, and we would like to use this opportunity to thank him for the energy and attention he put into this report.

The publication gathers a variety of cases studies, from drought in some of the poorest areas of Sub-Saharan Africa, to Hurricane Sandy devastating the North-East United States. It documents sudden crises such as Typhoon Bopha, planned development-induced migration from hydroelectric dams in China and the Lower Mekong Delta and slow-onset droughts displacing pastoralists in Kenya. The 2012 edition also analysis short-term evacuations and people quickly rebuilding from 2012 floods in Australia, while also presenting the situation of people still displaced in Japan, Italy and Haiti. The structure of the volume that presents first emerging catastrophes and second ongoing crises gives us an opportunity to examine cases that made headlines in 2012, and revisit cases that have long been out of the news, but have remained problematic for countries and displaced people.

The variety of case studies proposed shows not only the many facets of environmental migration, but also the complexity of policy responses. Well planned migration can reduce vulnerabilities to the effects of environmental change and migration is the part and parcel of adaptation, disaster risk reduction and development policies. Migration in the context of environmental degradation and climate change takes many forms, hence, requires wide-ranging partnerships as it is as the cross roads of migration, development, urban and rural planning, disaster risk reduction, humanitarian, environment and adaptation policies.

THE YEAR 2012: MIGRATION AND DISPLACEMENT DUE TO ENVIRONMENTAL AND CLIMATIC FACTORS

The year 2012 was again marred by a series of natural disasters, affecting both developing and developed countries. Though hurricane Sandy was clearly the disaster that attracted the most attention, this year's edition of the *State of Environmental Migration* sheds light on a number of environmental changes, both sudden and slow-onset, which were often little covered by the media. Those include of course cyclones Bopha and Evan, which affected the Philippines and Samoa respectively, but also recurrent floods in Nigeria and India, for example. In 2012, according to the Internal Displacement Monitoring Center (IDMC), 32.4 million people were displaced because of natural disasters, a number that has doubled from 2011. The two largest disasters in 2012 are both due to flooding, leading to the massive displacement of 6.9 million people in Nigeria and 6.1 million in India.[1] Both disasters are presented in this edition.

As important as it may seem, this number does not account for those who were displaced as a result of slower, gradual environmental changes, or as a result of resettlement processes. And indeed, behind the generic term of 'environmental migration', this report highlights a wide range of mobility patterns. Included are situations of flights and evacuations, but also situations of mobility as a risk-reduction strategy, as a way to adapt to environmental changes, and also situations of resettlement, where the relocation is imposed by public authorities.

What have in common those evacuated in anticipation of hurricane Sandy and those resettled because of the building of dams in SouthEast Asia?

1. IDMC, 2013

Not much, if not the fact that their displacement was driven, in full or in part, by environmental changes that made their home no longer inhabitable. Is it a sufficient reason to label them as 'environmental migration', as we did in this report? We believe so.

Environmental migration, as a concept, encompasses a wide array of different types of mobility, as we have tried to show again in this report. Yet environmental factors remain often neglected in migration studies, or are confined in the media to highly visible displacements related to climate change, and to sea-level rise in particular. Thus what this report seeks to do is to highlight the diversity of mobility patterns related to different kinds of environmental changes, and their embedment in varied social and economic contexts. Many have criticized the concept of environmental migration for obliterating the responsibility of political and economic actors in migration and displacement. This report adopts a different approach, and aims to stress the increasingly important role of environmental changes in migration and displacement across the world, through diverse mobility patterns that would otherwise have very little in common. Doing so, it also stresses the importance of the role of the state in preparing and managing these population movements, which sometimes goes as far as provoking and organizing these movements directly, as in the cases of resettlement. In addition to the chapters that document the population movements themselves, this report also includes some boxes that highlight the role of disaster risk reduction policies in preventing displacement.

NEW POLICY DEVELOPMENTS AND EVIDENCE IN 2012

Three main policy areas offered increased space for environmental migration in 2012: the climate domain, the migration domain, and the human rights protection domain.

As far as the climate change negotiation agenda is concerned, Parties met in 2012 at the Conference of the Parties (COP) 18 of the United Nations Framework Convention on Climate Change (UNFCCC) in Doha, Qatar. The COP18 ended with the adoption of the "Doha Climate Gateway" which is a package of agreements including a new commitment period under the Kyoto Protocol. Additionally Governments agreed on a timetable to negotiate a new legally binding international climate agreement by 2015, which will cover all countries from 2020. Social and human dimensions of climate change gained preponderance within the climate change negotiations while natural and social sciences seemed to find more common ground for discussion, within the side events that took place at the negotiations. However, migration remained marginal on the negotiation table in Doha. Even more disappointing, no further progress has been made on the implementation of the paragraph 14(f) of the 2010 Cancun agreement that anchors migration in the climate change text. Yet one of the main outcomes of the COP18 is the inclusion of a decision on loss and damage which opens a pathway for the most vulnerable populations to be provided with better protection and compensation. This loss and damage decision mentions migration, displacement and human mobility in the Paragraph 7 (a)(vi) and invites voluntary work for increased understanding on "*How impacts of climate change are affecting patterns of migration, displacement and human mobility*". The Group of Least Developed Countries (LDCs) and the island states played a strong role in the decision and they are also the states where the impacts of climate change strongly affect the mobility of population. The loss and damage advances represent a good entry door for states to consider human mobility in the context of climate change.

The year 2012 was of importance to IOM in terms of migration crisis policy framework, a policy concept directly relevant to migration, environment and climate change issues. According to IOM, migration crisis "*describes the complex and often large-scale migration flows and mobility patterns caused by a crisis which typically involve significant vulnerabilities for individuals and affected communities and generate acute and longer-term migration management challenges. A migration crisis may be sudden or slow in onset, can have natural or man-made causes, and can take place internally or across borders*"(MC/2355)[2]. IOM's Migration Crisis Operational Framework (MCOF) was developed at the request of IOM Member States, pursuant to their growing interest in the migration consequences of crisis situations. The frameworks considers two scenarios of relevance to environmental migration: on the one hand internal and cross-border movements due to low-onset natural disaster; and on the other hand, internal and cross-border movements due to sudden-onset natural disaster. One noteworthy policy development to be mentioned is on the human rights and climate policy strand. The eighth Session of the Human Rights Council Advisory Committee in Geneva, included the organization of a Seminar to "Address the Adverse Impacts of Climate Change on the Full Enjoyment

2. http://www.iom.int/files/live/sites/iom/files/About-IOM/governing-bodies/en/council/101/MC_2355.pdf

of Human Rights", devoted to understanding international cooperation and respect for human rights in all climate change related situations[3]. The seminar contributed to raising awareness and understanding of the relationship between climate change and human rights and to enhance cooperation among all relevant actors. Moreover, the Special Rapporteur on Human Rights of Migrants, François Crépeau, submitted a report on the "Human Rights of Migrants" (August 2012)[4] with a thematic section dedicated to the impacts of climate change and some of its consequences for migration. The report recommends that "*States must collectively recognize that migration is part of the solution to global environmental challenges*" as well as "*identify in priority vulnerable populations who are susceptible to migrate internally or internationally* (…)".

Over the year 2012, the role of environmental factors as key drivers of displacement has been increasingly recognized in the protection sphere as well. In October was launched the Nansen Initiative, an intergovernmental process supported by the governments of Norway and Switzerland that seeks to promote a protection agenda for those displaced across borders by natural disasters.

Environmental migration has also made some progress within two other significant policy tracks, the disaster risk reduction and the development ones, yet it remained on the side ways of these processes in 2012. At the request of the Special Representative of the Secretary-General for Disaster Risk Reduction, the senior level management group for Disaster Risk Reduction and Resilience was called to identify and act on core issues and gaps in disaster risk reduction in preparation of the 2013 Global platform on Disaster Risk Reduction (DRR). This collaboration also offered ground for bringing human mobility issues on the DRR policy agenda. Furthermore, migration was recognized as relevant in the context of environmental cooperation at the 2012 United Nations Conference on Sustainable Development (Rio+20), held in Brazil in June 2012[5]. If migration is indeed mentioned in these policy frameworks, many more efforts of research and advocacy are necessary to make human mobility a key feature in development and DRR frameworks.

Finally, the year 2012 also saw the release of new evidence on migration and environment, for instance the IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) that highlights the relationships between climate change and extreme weather events and strategies to manage associated risks[6]. The report *Where the Rain Falls* produced by the United Nations University Institute for Environment and Human Security UNU-EHS and Care explores the complexities of rainfall patterns and their effects on food security and human mobility in eight countries, Guatemala, Peru, Kenya, Tanzania, India, Bangladesh, Thailand and Vietnam[7]. Another important study with a regional scope was released by the Asian Development Bank (ADB) on *Addressing Climate Change and Migration in Asia and the Pacific*[8] presenting the actual and potential impacts of climate change on migration in Asia and the Pacific[9]. This regional focus also corresponds to the prevalence of Asia case studies in this publication. The importance of natural events with a human mobility dimension has also led to the launch in 2012 by the ADB and IOM of a new regional knowledge platform Asia Pacific Migration and Environment Network APMEN devoted to expertise exchange on environmental migration[10].

ABOUT THIS EDITION

As in previous years, this report is based on the works conducted by students of the course "Environment and Migration" taught at Sciences Po (Paris School of International Affairs, PSIA), and would simply not exist without them. Each chapter documents a recent case of migration related to environmental changes, through a careful review of secondary sources and interviews with actors who were directly involved in the protection and/or assistance to those displaced. They do not seek to cover all cases of environmental migration that took place in 2012 – this would be an impossible task. Instead, they aim to provide empirical evidence of some of the most significant cases from 2012, and hopefully they pave the way for future academic research and policy developments.

The report is divided in two parts. The first section addresses cases of flights and evacuations.

3. Concept Paper Seminar on Addressing the Adverse Impacts of Climate Change on the Full Enjoyment of Human Rights, February 2012, OHCR
4. http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N12/460/71/PDF/N1246071.pdf?OpenElement
5. Outcome document of the United Nations Conference on Sustainable Development (Rio+20) http://www.uncsd2012.org/thefuturewewant.html
6. http://www.ipcc-wg2.gov/SREX/
7. http://whereterainfalls.org/
8. ADB, 2012
9. http://www.adb.org/publications/addressing-climate-change-and-migration-asia-and-pacific
10. http://www.apmen.iom.int/en/

Cases that are documented here include the evacuation related to hurricane Sandy in New York and New Jersey, but also those related to typhoon Bopha in the Philippines and cyclone Evan in the Samoa. The displacements related to recurrent floods in Assam and Brahmaputra are also documented in a chapter. These chapters are enriched with boxes highlighting the disaster risk reduction policies that were taken with regard hurricane Sandy in Haiti, cyclone Giovanna in Madagascar, hurricane Isaac in Louisiana, as well as floods in Australia, Mozambique and Nigeria.

The second section documents different patterns of mobility, resettlement and return. The case of pastoralists driven away from their homes by soil degradation and droughts is addressed in a comparative chapter that contrasts patterns of mobility in Burkina Faso and Mali, while another chapter addresses the complex situation of pastoralists who were displaced because of the drought in Northern Kenya. Finally, two chapters tackle some specific cases of displacement, return and resettlement: one documents the current situation of the Fukushima evacuees, more than one year after the disaster, while the final chapter reviews the resettlement induced by the building of dams in the Mekong region. In this section as well, different boxes document how different environmental changes were addressed by authorities: the recurrent disasters in Bangladesh and the current situation of those resettled because of the earthquake of L'Aquila in 2009.

This year again, the *State of Environmental Migration* presents a complex picture of the migrations and displacements induced by environmental changes. Yet, as the scientific evidence mounts up, policy progress remains too slow and insufficient. Hopefully this edition will show the variety of policy responses that are needed, and will prove useful for future academic research and policy developments.

METHODOLOGICAL CONSIDERATIONS

PAULINE BRÜCKER & FRANÇOIS GEMENNE

Since its first edition, the format and the themes of the *State of Environmental Migration* have evolved, reflecting upon the complexity and diversity of the phenomenon and our willingness to bridge and feed growing interests amongst individuals, scholars and policy makers. This third edition reviews major events that occurred in 2012. Our understanding of what is and what means "environmental migration" is as large as witnessed events suggest it to be. The challenges faced by the contributors in their research brings new and interesting lights on the challenges of researching on extremely recent event, especially in cases of complex phenomenon. They may feed on-going debates on the methodology of environmental migration research.

THE CHALLENGES OF UNDERSTANDING A COMPLEX PHENOMENON

The difficulties of researching environmental migration have been widely acknowledged. An expanding body of literature addresses the notion of "environmental migrant" and questions both its multi-causality (Castles, 2002; Kibreab, 1997; Diamond, 2005; Lonegan, 1998; Foresight, 2011) and its internal dimension (IOM, 2009; Foresight, 2011) – two main challenges for scholars to label migrants as 'environmental migrants' and to move from correlation to causation. Secondly, providing a clear picture of the frameworks applicable and assessing the efficiency of the humanitarian responses provided to those displaced can be extremely challenging for researchers seeking to establish both the norms in practice and the responsibilities of all actors at stake. The protection of environmental migrants has indeed been increasingly discussed among scholars but also amongst policy makers, resulting in the suggestions to either create new normative frameworks, or at least, to provide comprehensive guidelines to ensure systematic responses (Zetter, 2008; McAdam, 2011). Yet, as for now, most of the policies applicable to environmental migrants are disaster risk reduction frameworks, and possibly, national translations of the 1998 Guiding Principles on Internal Migration, left at the discretion of states a comprehensive review of those frameworks and their applications would be valuable for expanding our knowledge on the political sociology of environmental migration management, especially in a comparatist perspective.

Methodological concerns for research on environmental migration have been tremendously expanding. A multiplicity of methods have been used in current and recent research on the topic, such as ecological inference based on area characteristics, individual sample surveys, time series, multilevel analysis, agent-based modeling (ABM), and qualitative/ethnographic studies (Piguet, 2010). The multiplication of training activities is symptomatic of a quest for a renewed understanding of the tools to apply on the field but also in the analysis of public policies, in their great diversity. Many challenges remain however, related for instance to the nature of the environmental events, especially slow-onsets events triggering diffuse migration flows often particularly difficult to quantify (IOM, 2009).

The methodological reflection gathered here in the frame of the *State of Environmental Migration* reflects particularly on the conduct of research in the aftermath of a disaster or slow onset events.

THE METHODOLOGY OF *THE STATE OF ENVIRONMENTAL MIGRATION*

The choice to divide this edition into two main sections - "Flight and Evacuations" and "Mobility, Resettlement and Return" – derives from the willingness to focus on the type of movements rather than on the type of environmental events triggering the migration. Although the division may seem superficial in substance, it emphasizes the nature of migration, i.e. who is moving, how, when and why, and the subsequent challenges associated. It takes a step away from the classical division, yet adopted in previous edition of the *State of Environmental Migration*, between sudden and slow onset induced displacement.

As for the last editions, the choice of the cases studied was based on predefined criteria. They needed to address events that occurred in 2012 or

that were still on-going in 2012. They also needed to present and assess the policy and humanitarian responses implemented, and possibly normative changes if they were to happen, pre- or post-disaster.

Interestingly, this edition sheds light on major cases that occurred in industrialized countries, including hurricane Sandy in New York, floods in Australia, the earthquake of L'Aquila in Italy and challenges related to post-Fukushima return. This edition, once again, emphasizes on the many obstacles to protection but also brings light on best practices throughout the world. We truly believe that research must be held outside of the box and beyond overrun paths, as environmental migration is a truly worldwide concern. The rationale for our geographical coverage concurs with this orientation.

The originality of this approach allows this volume to cover recent events that, precisely because of their temporal proximity, are little addressed by research scholars. Some would argue that those cases do not offer the appropriate hindsight to provide a comprehensive assessment of the situation. To this, we argue that there is on the contrary a need to gather the first data released on such situations, confront the sources in their great variety, but also underscore what type of data may be missing in the very aftermath of a disaster, and how this may undermine the quality of the response.

Accordingly, the methodology applied in all the following chapters try capture both quantitative and qualitative information on each specific case. no field work was undertaken in this 2013 edition, only one student was able to pursue local research. However, the joint publication with IOM has progressively facilitated students' contacts with IOM staff members on the field, which has allowed some of them to rely on first-hand sources. Others have chosen to interview other experts such as journalists, scholars, policy makers etc. The key sources of information remain governmental agencies' reports, international, national and non-governmental humanitarian and emergency relief reports, along with a great amount of press articles.

Such combination of grey literature and news articles, rather than first-hand material collected on the field, may be criticized by our peers. However, the goal of the *State of Environmental Migration* is to provide scholars and non-academics with first insights. Those sources allow for a comprehensive understanding of the diversity of the discourses on environmental migration therefore analyzed in their social context.

This being said, students were faced with enormous challenges in their research. We have thus asked them to reflect upon their experience and to share some of their thoughts. The following points underscore those that appeared as the greatest obstacles. Our goal in sharing them for the first time in this edition, is to bring a new voice to the literature on environmental migration methodology.

- *Recentness of the event:* The recentness of the event was a main challenge in all researches. Migration movements were still on- going, impeding any possibility to provide quantitative data, or to evaluate emergency policies implemented. Most of the data was often found contradictory. The reliability of press articles was sometimes a problem and that they tried, as much as possible, to confront the different secondary sources used. More generally, the recentness of the event interrogates on whether it is possible to take a step back to provide an informed but cautious picture of its impacts, responses and consequences.
- *Managing the great variety of sources:* a consequence of the recentness of the analysis is the necessity to resort to a great diversity of sources. All chapters of this volume are mainly based on secondary sources, especially newspaper article and grey literature. Though this seemed the most practical way, it raises questions on the possible treatment of media and institutional sources, their multiplicity, their political orientation and content, at times contradictory. To overcome such obstacles, a constant care to *who* was providing the information, *how, why* and *when* – was required from the students. They were also encouraged to raise contradiction in their material, and to reflect on these contradictions if they were pertinent with regard to the subject of research.
- *Accessing quantitative data:* research on environmental migration has long focused on the question of numbers, as one tool to raise awareness about a phenomenon at the beginning politically marginalized. Yet, providing clear-cut data on the scope of environmental migration is a main challenge raised by all contributors, especially in such short timelines. Some students found it particularly surprising in countries such as the United States of America – this stresses how politically charged may be any act of quantification. Another problem faced was the uniqueness of data: in some case, only governmental data were available or on the contrary, international organizations' provided by OCHA. In other cases, they were no data on environmental migrants as such: aggregated data on migration at large was at times the only one accessible, highlighting once more the complex multi-causality of environmental migration, along with the political games that may hide behind numbers and labels.

- *Sensitivity of the subject:* Environmental migration remains a sensitive subject for many governments. Reluctance was sometimes observed with regard to the access to information, and some problems occurred also at times with the field staff interviewed.
- *Comparing the incomparable?* Beyond the challenges faced by each contributor, the structure itself of the SEM is a main challenge to the sociology of public policies. As we said, the multiplicity of policies managing environmental migration – i.e risk management, disaster risk reduction, humanitarian assistance and emergency, migration policies, along with the multiplicity of actors behind those rules, raises many question with regards to the possibility of operating any type of compared analysis. It also questions the pertinence of comparing cases that seem incomparable in appearance– or on the contrary may underscore how our perception of what may be compared is erroneous.

Accordingly, the research produced here offers food for thought and opens perspectives onto future researches to be undertaken by scholars, through a methodology borrowing from the sociology of public policies, the sociology of migration and the political sociology of the State, in a multidisciplinary perspective. It seeks to provide a comprehensive image of who moved, who could not, why, and under which conditions.

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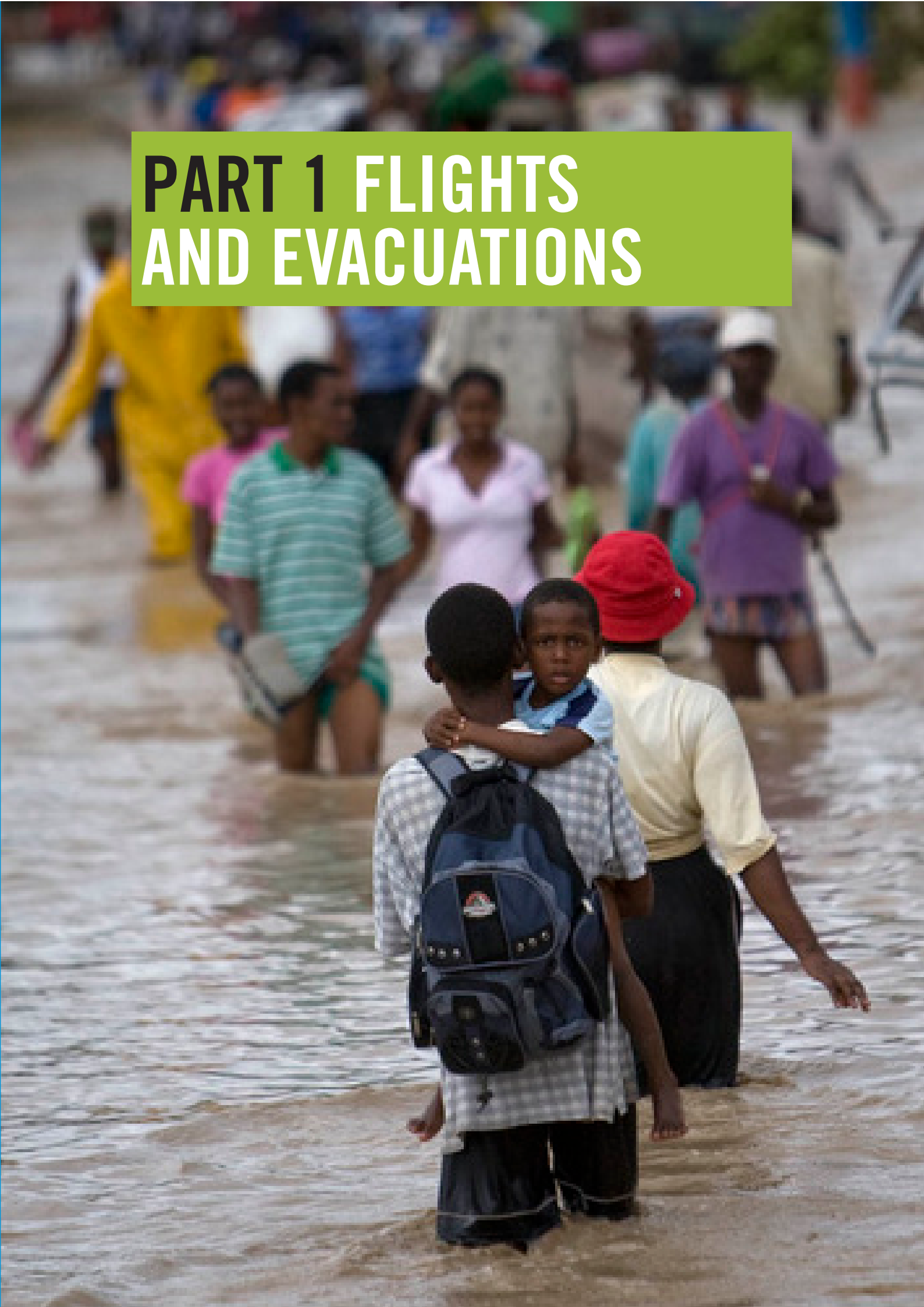


PART 1 FLIGHTS AND EVACUATIONS

HURRICANE SANDY IN NEW YORK AND NEW JERSEY: EVACUATION, DISPLACEMENT AND ADAPTATION

FANNIE DELAVELLE

INTRODUCTION

"Maybe things like this happen in New Orleans, places like that. But never here, not in a million years."
V. Baccale, 2012

Vinny Baccale's family had lived on Staten Island for generations, starting with a small holiday bungalow to building a permanent home on the seaside. This area was hit particularly hard by the storm. Like thousands of New Yorkers, Baccale, his wife and two small kids were forced to evacuate when their seaside home was partially destroyed by the storm. Despite their strong roots in the area, they are now considering relocating to a safer neighbourhood (J. Rudolf, 2012).

Hurricane Sandy was a shock for many New Yorkers who had to admit their vulnerability to environmental disasters. Vinny Baccale's remark underscores the persisting perception in many developed countries that such disasters only happen in other places, to other people. Hurricane Sandy, as Hurricane Katrina before it, reversed this idea, showing that developed and relatively wealthy metropolises like New York City are at risk, and that environmental displacement is a concern for all countries, no matter their level of development.

This paper begins by analysing the characteristics of the storm itself, and by evaluating New York City's vulnerabilities to environmental disasters (Part I). It then assesses the evacuation process as well as the forced displacements, with an emphasis on the authorities' management of the crisis both in the short and middle term. A special section is dedicated to the impact of the storm on the elderly and on low-income persons (Part II). Finally, the report addresses the issue of New York's adaptation to environmental disasters, evaluating previous efforts and putting forward proposals for future projects, particularly the option of relocation as an adaptation strategy (Part III).

1. HURRICANE SANDY AND NEW YORK'S VULNERABILITIES

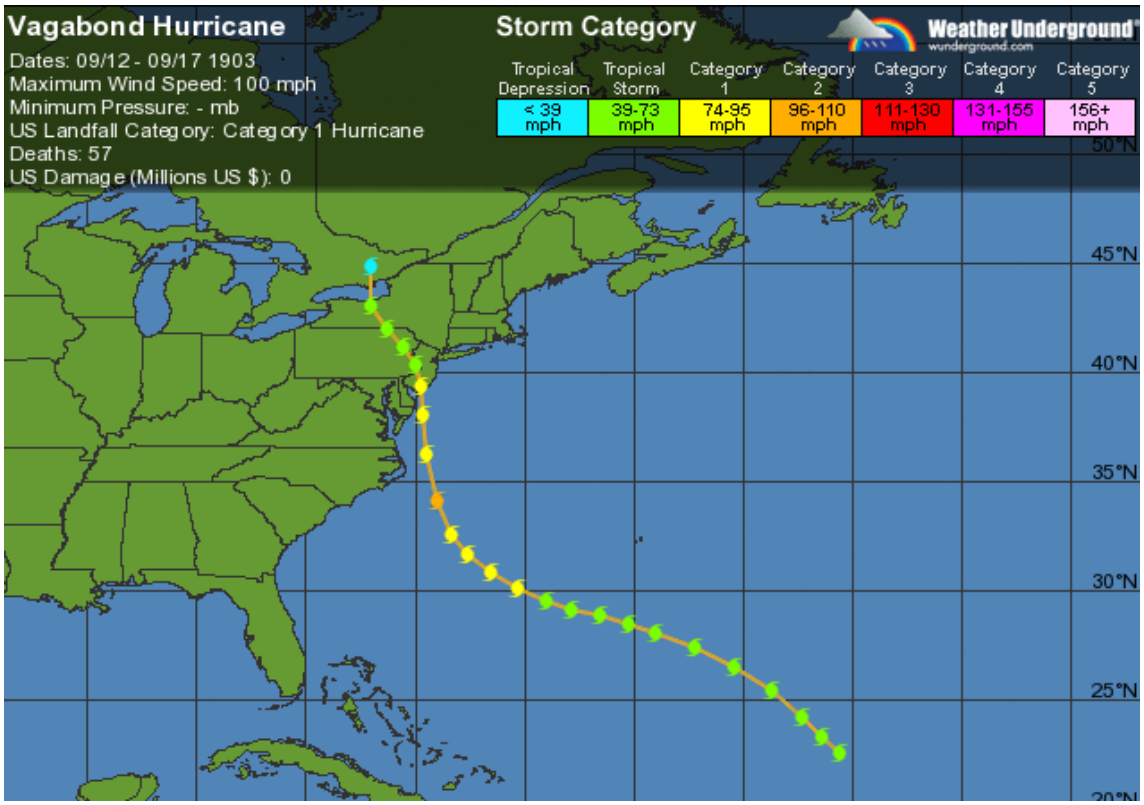
1.1. Hurricane sandy, a record breaker

Hurricane Sandy was a record breaker in many ways. On 29 October 2012, its central pressure reached 940 millibars, the lowest-measured barometric level for an Atlantic hurricane. It also caused a record surge of water for New York City, with a water level of 4.2 meters at Battery Park on October 29th (Drye, 2012). Furthermore, Sandy was much wider than previous storms, with hurricane-force winds spreading over a diameter of 400 hundred kilometres around its eye.

In the afternoon of October 29th, Sandy brought strong winds and rains from Washington D.C. northward. It was downgraded to the post-tropical cyclone category before it hit Southern New Jersey around 8 p.m. EDT, near Atlantic City, with winds of 129km/h (Sharp, 2012). Sandy moved its way up to New York, where its surges topped seawalls at the Battery and flooded Lower Manhattan. The storm's massive size caused flooding, rain and high winds to continue affecting New York and New Jersey throughout the night. On October 30th, Sandy had left New York, although its tail-end was still causing considerable damage on the Northeast. The storm started to weaken in the afternoon of October 30th and dissipated on October 31st over Pennsylvania. Sandy caused the death of 109 people in the United States, including 40 in New York City (Drye, 2012).

The most destructive characteristic of the hurricane was the storm surge, that affected parts of

Map 1. Sandy's track: September 9-17, 2012.



Source: Wunderground (2012)

the Northeast, which is home to 10 per cent of the US population (Murphy, 2012). A combination of several factors magnified the damaging effects of the floods.

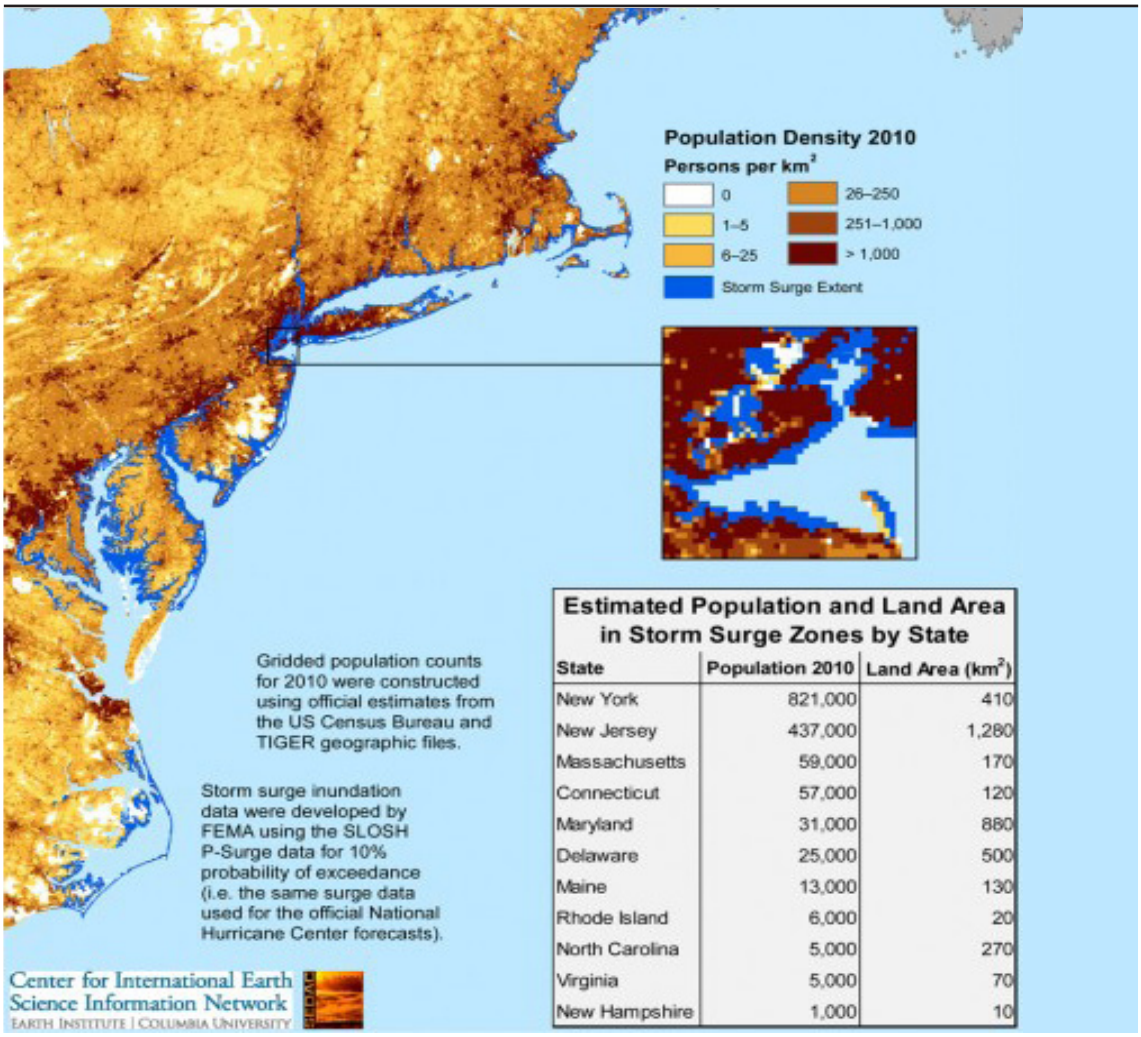
1.2. Short and long term exacerbating factors: the full moon and sea level rise

First, Sandy made landfall during the full moon, while the tide was 20 per cent higher than usual (by about 30 cm) (Khan, 2012). Although the initial waves were not as high as in previous storms, the high tide caused the water levels to flow over sea walls and other protections. Second, the impact of the full moon combined with the longer-term phenomenon of sea-level rise. Although the storm itself might not be directly connected to climate change, the damaging power of the floods partly was. Since 1900, as a consequence of the ocean's thermal expansion and of the melting of ice caps in the Arctic, the sea level in the New York region has risen of about 30c m–twice as fast as water levels of coastal regions in other states (Khan, 2012). New York and New Jersey are particularly vulnerable to the effects of sea-level rise, principally due to natural and man-made forces like erosion that reduce the amount of offshore sand. By 2080, experts have predicted, through the approach of the Intergovernmental Panel on Climate Change, that the sea level will rise in the New York area by 30-58 cm in the best case scenario and 1.0-1.4 meter in a rapid-ice-melt scenario (Khan, 2012). Although the range of these projections remains very broad, they point out that hurricane of the same strength will provoke more intense damage as the surges are worsened by the higher baseline sea level (Avent, 2012).

1.3. The New York Bight

The hurricane's unusual path led its strongest winds –on its front and right-- to hit the angle between New Jersey and Long Island that forms a tip called the New York Bight. This sharp curve on the open coastline significantly magnified the impacts of the hurricane, as the waves composed of ocean water and rain accumulated in the New York harbour. The high surges were boxed in, and pushed onshore into the flood zones (Murphy, 2012). This mechanism was amplified by the relative shallowness of NYC waters that made the surge go even farther onto land.

Map 2. Population density in New York region



Estimated Population and Land Area in Storm Surge Zones by State

State	Population 2010	Land Area (km²)
New York	821,000	410
New Jersey	437,000	1,280
Massachusetts	59,000	170
Connecticut	57,000	120
Maryland	31,000	880
Delaware	25,000	500
Maine	13,000	130
Rhode Island	6,000	20
North Carolina	5,000	270
Virginia	5,000	70
New Hampshire	1,000	10

Source: Centre For International Earth Science Information Network – Earth Institute, Columbia University (2012)

Sandy's destructive power was thus amplified by a combination of short-term climatic phenomena, gradual environmental evolutions and the intrinsic geographical vulnerabilities of the region.

Map 3. New York Bight

Source: Murphy, OEM/City Limits (2012)

1.4. Demographic and infrastructural vulnerabilities

The damage Sandy provoked was further exacerbated by the demographic and infrastructural characteristics of the East Coast. New York City is particularly densely populated on its extensive 930km of coastland (Jones, 2012). According to the New York City Office of Emergency Management, about 2.3 million persons would be in high-risk if a Category 3 hurricane hit the area --three-times the combined potentially vulnerable population in New Orleans and Miami.

In addition to its demographic density, New York's infrastructural characteristics make it especially vulnerable to hurricane damage. The many suspension bridges added to New York's wind vulnerability, forcing authorities to close all bridges to avoid their collapse. These closures reduced the number of evacuation routes (Silverman, 2012).

Third, New York's subway system is quite prone to flooding. When it was designed over a century ago, authorities did not anticipate the impacts of hurricanes causing subway grates to be flooded. City officials/transportation authorities made few changes since the initial construction to provide a better protection of urban subways, mainly due to inadequate funding. As Lower Manhattan was flooded, underground networks were immediately filled with water despite the sealing off procedures that had been developed.

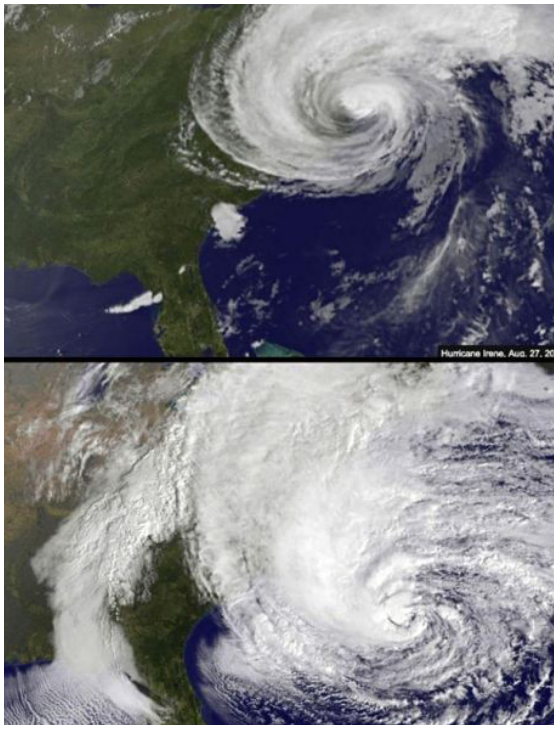
1.5. Winter storm Athena aggravates Sandy's damages

The damage caused by Hurricane Sandy was aggravated by a second storm, which hit the New York area from 7-10 November 2012. This early winter storm brought up to 20 cm of snow and rain across regions that had been significantly affected by Hurricane Sandy (Hydrometeorological Prediction Centre, 2012). The storm also caused high waves of 2.4m, flooding many coastal roads and stalling post-Sandy repairs. An additional 50,000 households lost power in New York and New Jersey, adding to the 640,000 still without power after Sandy (The Associated Press, 2012).

1.6. Hurricane Irene increased new york's vulnerability to hurricane sandy

Before it made landfall, Sandy was widely compared to Hurricane Irene that had hit the same region in late August 2011. Irene was ranked the seventh costliest hurricane in the history of the United States, with an estimated total cost of USD 19 billion, and caused 56 deaths (Fischetti, 2012). However, it did not impact the New York area as authorities and the media had anticipated, because it weakened from a Category 3 storm at sea to a tropical storm at landfall in New Jersey, with 121km/h winds. The highest recorded rainfall measurements in New York barely reached 30 cm, in comparison with the Sandy floods that were measured in meters. The relatively low damage it inflicted compared to the predicted disaster led many to criticize the authorities' "overreaction." Indeed, in its preparedness, the city had evacuated 370,000 people and had shut down subways, airports and buses 18 hours before the storm was expected to hit (Barron, 2011). Although the mayor argued he based his decisions on the side of caution, the criticisms partly led the authorities to adopt a slightly less cautious attitude during Sandy, which proved to be much more devastating (Nye, 2012).

Figure 1. Hurricane Irene (top) and Hurricane Sandy (bottom)



Source: NASA (2012)

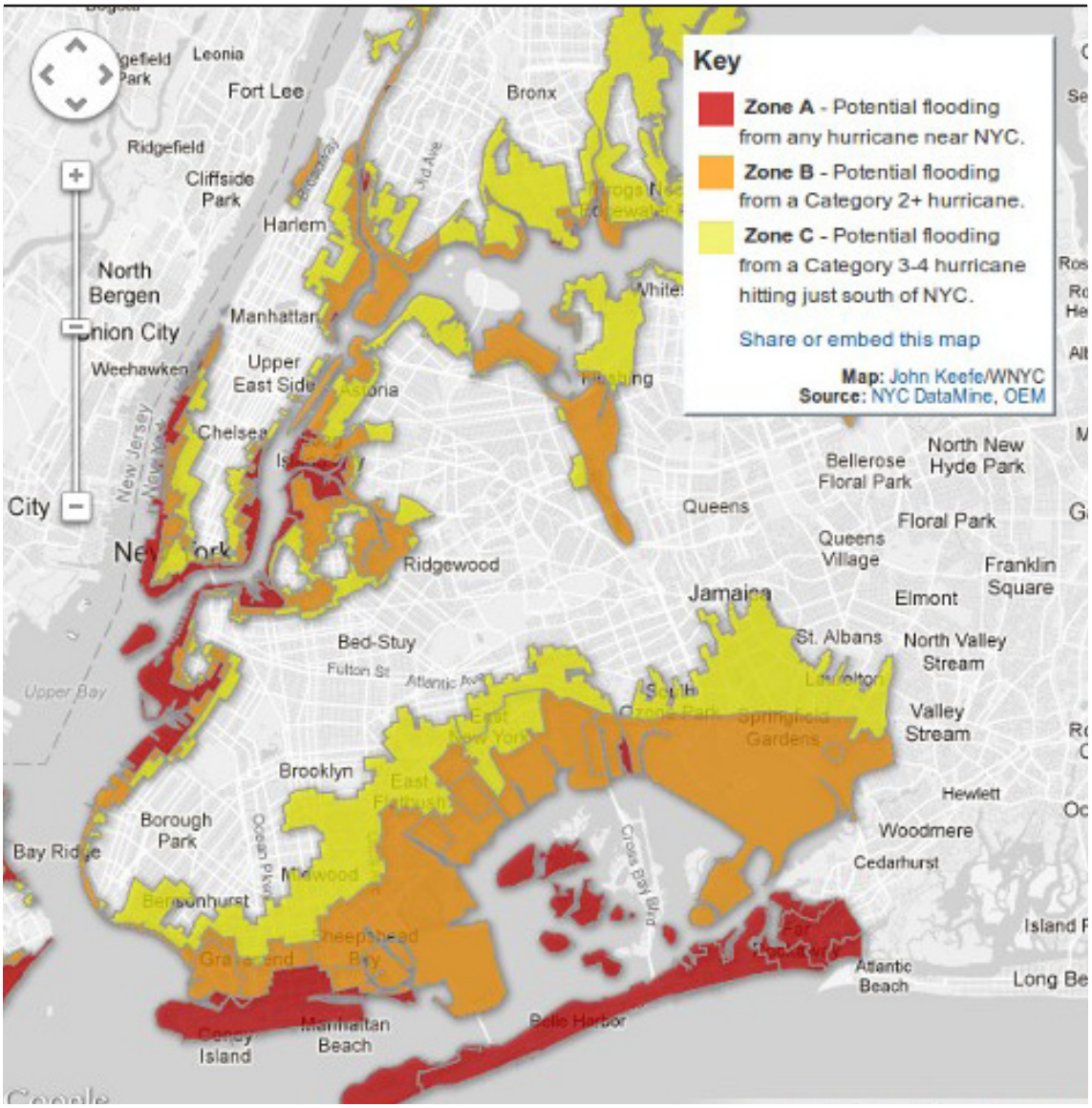
2. EVACUATION AND DISPLACEMENT: WHEN THE UNBELIEVABLE BECOMES REALITY

2.1. The multiple waves of evacuation

Over a week after Hurricane Sandy hit, New York City authorities stated that the number of displaced persons ranged from 10,000 to 40,000. The lowest figure corresponds to the number of people who registered in public shelters, where an official count could be made. Any number above this is a broad approximation, as many people did not go to shelters, and as part of the population in evacuation zones did not evacuate (Jones, 2012). Furthermore, the numerical estimation is complicated by the multiple waves of evacuation.

On Sunday, October 28th, Mayor Bloomberg issued evacuation orders for low lying areas, including sections of lower Manhattan, parts of Staten Island and Brooklyn, Coney Island and the Rockaways in Queens. These areas, populated by 375,000 people, represent the city's evacuation "Zone A" (Gupta, 2012). The first wave of evacuation was therefore mostly composed of the inhabitants of Zone A who followed Mayor Bloomberg's

Map 4. SLOSH Model of evacuation zones



Source: New York City Office of Emergency Management (2012)

order.The three evacuation zones A, B and C[1] had been designed by NYC's Office of Emergency Management in the late 2000s, on the basis of a SLOSH model that showed the areas of the city vulnerable to flooding.

Further evacuations took place after Hurricane Sandy hit New York City on Monday October 29th in the evening, as New Yorkers began to feel Sandy's destructive power. This second wave of evacuations included households in the mandatory evacuation zones that had not yet obeyed the mayor's order, as well as households in other areas who were either forced out of their houses by the unexpected damage of Sandy, or voluntarily left in precaution.

In the following days, evacuations continued as many households were forced to move out of their houses because of the prolonged power outages. A week after the storm, 1.8 million people remained without power, and it was weeks before electricity was restored in some areas, while the already low winter temperatures continued declining (Mazelis, 2012).

From November 7th to November 10th, winter storm Athena prompted further evacuations as snow and rain accumulated in areas that had been

1. Zone A represents the lowest-lying areas of the city, most vulnerable to surges. Zones B and C represent the regions that are expected to be flooded by hurricanes of higher intensity. The order to evacuate Zone A corresponded to the predictions that the hurricane's intensity was decreasing, but might still be Category 1 at landfall.

previously hit by Sandy. The winter storm caused further power outages, forcing individuals out of their houses to find shelters with heating and electricity, and amplified Sandy's damage, as snow accumulated on broken roofs and caused the fall of further trees.

These differences in the time and date of evacuations were partly caused by the lack of obedience to Mayor Bloomberg's evacuation on Sunday 28th. One explanation for this refusal to follow the mayor's orders is the scepticism of the population towards the authorities' warnings after their "overreaction" after Hurricane Irene in 2011 (Preston, 2012). This scepticism was amplified by the National Hurricane Centre's downgrade of the hurricane to a post-tropical storm before it made landfall, decreasing the population's risk perception. Furthermore, the authorities added to the confusion by announcing that nursing homes in evacuation zones would not be evacuated. Many people deduced that the storm would not be much more severe than Hurricane Irene, and decided to ride it out (MacDonald, 2012). The dispersion in the dates of evacuation was also caused by the authorities' two-fold response. Mayor Bloomberg first declared that evacuation would not be necessary, as the authorities were expecting a slow accumulation of water rather than a sudden surge, as they were comparing Sandy to Irene. However, on Sunday 28th, the day before Sandy hit New York, the tone completely changed as he ordered a mandatory evacuation of Zone A, the low-lying areas of the city (Preston, 2012). The late order left little time for people to evacuate, causing many New Yorkers to ignore the order, both because they were not psychologically and physically prepared to evacuate, and because they considered that such a late order must be an overreaction. Those who did follow the order had so little time that they often took few personal belongings with them (assuming they would be back after a few days) whereas they were actually often displaced for extended periods of time (Barron, 2012).

Another interesting reason for the refusal to evacuate is that most New Yorkers had too little experience responding to hurricanes to have built a response culture. This human factor plays an important role during evacuation processes, as people often measure the risks against similar past experiences (Monitz, 2013). As the situation was new for most New Yorkers, many made misjudgements on the ways to respond, for instance, by disregarding evacuation orders. In addition to this psychological element, a great obstruction to the efficiency of evacuations turned out to be the lack of knowledge on the evacuation zones. Although Hurricane Irene had strengthened the familiarity with the zones' boundaries, many residents were still unsure which zone they lived in, revealing a lack of awareness of the risks posed by hurricanes. The city's evacuation and early warning procedures should be improved, particularly by enhancing the dissemination of information about the endured risks.

2.2. From short-term evacuation to displacement

The shelter challenge

The various evacuations waves can therefore be distinguished according to their time of occurrence, but also, and most importantly, according to their length. While some evacuees were able to return to their homes just a few days after the hurricane hit, other households were still displaced in May 2013. The length of displacement is largely to be correlated to the damage to the evacuee's home. Whereas some buildings were only lightly damaged, many structures were either severely affected or completely destroyed. In such cases, evacuees turned into displaced persons, as they were unable to return home. It is estimated that about 40,000 persons became homeless because of Sandy, in New York City alone (Mazelis, 2012).

In the first few days after Sandy's landfall, officials provided emergency shelters for evacuees, usually in public schools (Bernstein N., 2012). While a few successful examples can be highlighted, such as the opening of recently closed Fort Monmouth for 600 displaced families (Bonamo, 2012), provisions for shelters and transitional housing were not adequate. In the weeks following Sandy, the evacuees had to be relocated several times, as schools were reopened or as they decided to move to another shelter in the hope that it would be less overcrowded. Many were moved to drill floors and armouries, but the conditions were often precarious (Bernstein N., 2012). Sandy highlighted the lack of space in New York City, in comparison to its dense population, as well as the lack of emergency preparedness of local authorities. The shelters were usually filled to twice their capacity, and the city struggled to find additional spaces to welcome new comers. In response to this situation, the Federal Emergency Management Agency (FEMA) –in coordination with NYC officials- reserved hotel rooms, sometimes luxury ones, across Manhattan, Brooklyn and Queens, as a transitional solution. However, as evacuation centres were progressively closed to rely only on hotels, officials faced the new wave of displaced people from houses lacking heat and hot water, in the cold winter, forcing them to re-open some shelters and book additional hotel rooms (Bernstein N., 2012).

When evacuation turns into displacement

After the urge to find temporary shelter, authorities were faced with the necessity to provide longer-term structures for households whose homes were destroyed or inhabitable, and to launch a recovery programme for damaged houses. In early November, over 45,000 households were approved for housing assistance to help them seek a temporary living place, or repair their houses, for a total cost of over USD 203 million (Barron, 2012). However, the management of longer-term displacements was as debatable as the city's emergency preparedness. Once power was re-established, and individuals who could return to their homes had left shelters, the authorities started relying almost exclusively on FEMA hotel room system as a transitional solution for displaced families. However, if this option was adequate for transitional lodging, it was not designed as a long-term option. As weeks and months went by, the authorities discovered that the 'transitional' situation turned out to be 'quasi-permanent.' Three months after hurricane Sandy hit New York and New Jersey, at least 3,500 families remained displaced in hotels, often having to change rooms or hotels as reservations for conferences and parties came up (Zezima, 2013). Hotels close to affected areas were taken over, such as the Clarion Hotel in Toms River, where about 80 per cent of the guests were part of the FEMA programme in January. The expected cost for FEMA has amounted to tens of millions of dollars, with an estimated rate of USD 250 per room per night on average.

A positive aspect of the hotel programme is that it enabled most households to remain close to their former living places, thus preventing the need to change schools for children, and long commutes to the workplace for adults. However, the families lived in constant fear regarding their future, as the hotel stays expired every two weeks (Zezima, 2013). This lack of guaranteed stability was a great source of worry, as the FEMA's decision to renew the hotel stays was made on a case-by-case basis (Piore, 2012). Households constantly feared they would lose their right to hotel assistance, for instance if the FEMA decided that their homes were safe to come back to, that they had a sound insurance settlement or had received assistance to rent another place (Zezima, 2013). Although such reasons for the removal of hotel assistance seem reasonable, they added to the psychological plight of displaced households, and were occasionally applied in an arbitral manner, without taking some households' characteristics into account. This was sometimes the case for low- and middle-income households, who were shut out of the hotel assistance programme after receiving FEMA household assistance, but actually used that money to pay for gas to drive their children to school in their previous neighbourhoods, to drive to their jobs, to pay the mortgage on their damaged house, and to buy food. They, therefore, did not have any funds left to find proper lodging or to repair their homes, and had lower hopes to return to a stable existence in the short term. Furthermore, hotel stays were also very costly for the displaced families, as they did not have kitchens to cook in and had to order take-out or go to restaurants every day (Associated Press, 2013).

The number of displaced people gradually decreased from December to March as many households were able to return to their homes after they were repaired, or as they decided to leave FEMA hotels for a more stable situation, such as a rented apartment (FEMA, 2013). A small number of families whose houses were damaged but had land available opted for FEMA's "temporary housing units," which soon became negatively referred to as "FEMA trailers" (Barron, 2012).[2] The fact that some individuals preferred to move to trailers rather than remain in hotels underscores how inadequate FEMA's hotel housing programme was in the long term. It should also be mentioned that while some households left for other lodging options, many persons that had not previously applied for FEMA financial or lodging assistance were forced to request help as their personal circumstances evolved. Indeed, in many cases, individuals received help from relatives and friends for some time, but realized after a few months that this situation could not last any longer (Jones, 2012). In January, FEMA received about 60 new applications every day for financial and/or lodging assistance (FEMA, 2013). This point underlines that the situation was constantly evolving, as displaced people that had not been accounted for yet stepped out to ask for assistance. Overall, FEMA has registered over 250,000 households, and given over USD 370 million in assistance (FEMA, 2012). However, it is important to highlight that although the displaced households in hotels were the most visible, the majority of displaced individuals were "invisible," staying with relatives or friends, renting apartments, or remaining homeless. As such individuals have not been officially registered, it is difficult to evaluate the number of persons included in each category (Jones, 2012).

2. FEMA trailers are widely associated with New Orleans' Katrina victims, as over 230,000 FEMA trailers and mobile homes were used after the hurricane hit the city in August 2005, becoming part of the city's landscape. The last FEMA trailer was removed in 2012, over 6 years after the disaster. (Burdeau, 2012)

2.3. Sandy's long-term displaced

Five months after Sandy made landfall, over 500 people remained displaced and living in hotels in New York, through FEMA's temporary housing programme. Most of the remaining displaced households in hotels were either too poor to pay for their home repairs or were renters whose landlords had not dedicated the necessary funds to repair their apartments (O'Connor, 2012). In order to provide for this group, on March 29th, FEMA launched a "Disaster Housing Assistance Programme," in cooperation with the Federal Department of Housing and Urban Development, modelled on the one that was launched after Hurricane Katrina. This programme was designed to help displaced people who were still living in motels find long-term solutions, by temporarily paying their rent. It aimed at introducing more stability to their lives, by acting as "a bridge from displacement to a permanent relocation in their former houses" as Senator Chuck Schumer of New York declared. It was particularly designed for displaced families in hotel rooms who could not afford to rent an apartment. Indeed, after Sandy hit, many real estate firms such as Ashore helped by finding families homes in winter rentals. In December, some landlords accepted to prioritize displaced people for the rental of apartments at market price. Since these rentals were managed privately, it is not possible to evaluate how many of those displaced found acceptable housing. However, few people (or families) displaced by Sandy could afford rents at market price. Estimates show that 75 per cent of the households that applied had annual income inferior to the estimated USD 25,800 needed to qualify (FEMA, 2013). Although FEMA's Disaster Housing Assistance Programme represents a considerable improvement for the life of displaced households, families (or people) still live in the fear of leases ending, particularly with the beginning of the tourist season, when rent prices usually peak. Indeed, although FEMA will provide financial support by paying rent temporarily, landlords usually want to be assured that they will be able to keep paying once the assistance is removed (McKelvey, 2013). As this programme was only set in motion five months after the hurricane, the conditions of displacement were often precarious both in physical, financial and psychological terms for a developed city such as New York (Dawsey, 2013).

2.4. Displacement and social inequality - the diverse outcomes of Hurricane Sandy

Low-income people constituted a particularly vulnerable group to Sandy's impact. Before Hurricane Sandy, New York City had the largest population of homeless people, 47,000, and 4.9 per cent of the city's overall population lived in public housing structures (Huang, 2012). These buildings were usually quite old and badly maintained, with pre-existing mould problems that were aggravated by the floods. Evacuation orders were often ignored by the people with the least means, because of the high price associated with it. Sandy would have required evacuating relatively far away, and sometimes moving from shelter to shelter. These factors led many low-income people to try and ride out the storm.[3] Public transportation had been stopped on the 29th in the morning, before the hurricane hit, removing this cheaper option (Mathis, 2012). As the subway and train systems remained closed or with running with reduced frequency after Sandy, many households were unable to evacuate from their disaster-struck homes, and had to survive without power or basic food and health facilities. Another reason that led lower-income persons to stay in their homes is that the jobs they occupy are usually quite unstable. Missing a work day meant missing a day's salary, which is something that most public housing residents cannot afford (O'Connor, 2012). The number of people who filed for first-time unemployment insurance benefits after Sandy highlights the disastrous impact that Sandy had on the poorer groups: 120,000 applications were made in the period between November 10th and November 27th only (some of those applications may also have been filed as businesses closed due to damage). Furthermore, although the most publicized media reports after the storm showed the destroyed houses in coastal neighbourhood, we have to think about the losses proportionally to the person's assets. Homeowners who lost their house surely suffered, but usually had savings or resources to draw upon, in contrast with poorer renters who sometimes lost everything they owned (O'Connor, 2012). Almost half of all FEMA registrants indicated their annual income was below USD 30,000 (Enterprise Community Partners, 2012). Almost 45 per cent of them were renters, who usually did not have insurance for their possessions. Furthermore, in cases when the renter's home was damaged but not completely destroyed, they depended on their landlords' will and financial capacity for repairs. As landowners often lost other large assets during Sandy, these necessary repairs were not their priority, forcing many poorer households to live in precarious conditions in terms of health, with increasing mould, among other issues (O'Connor, 2012).

3. As gasoline is expensive, and many of them did not have cars (access to cars in New York is lower than in any other city in the United States).

THE ELDERLY IN THE FACE OF SANDY: A TALE OF DISPROPORTIONATE VULNERABILITIES

The intrinsic vulnerabilities of the elderly to environmental disasters

A specific social group, the elderly, was particularly affected by the hurricane's damage. Approximately 37 per cent of those who died in New York City because of Hurricane Sandy were 60 or older, whereas only 17.2 per cent of the city's population belongs to this age group (Synergy Home Care, 2012). Many elderly people drowned within their houses, while others suffered from fatal storm related injuries and hypothermia (Parry, 2013).

The elderly are extremely vulnerable to the effects of storms for two main reasons. First, elderly people are often socially isolated, making them more vulnerable in the case of a natural disaster. Although this isolation is sometimes unwelcomed, it most of the time stems from a choice: elderly people are more reluctant to ask for services or seek their family's help, because of a will to maintain their independence, and out of concern that they will bother others (Parry, 2013). This was often the case during Hurricane Sandy, when many elderly decided to "ride out" the storm instead of calling their families or rescue teams for help. Second, most of the disaster preparedness procedures are designed for healthy individuals, sometimes requiring a walk of a mile to the closest evacuation centre, or to take crowded buses. Elderly people have a small capacity of adaptation because of their limited physical capability to leave their home independently (Solecki, 2012). Most elderly cannot drive anymore, and find it physically or psychologically difficult to take public transports (Parry, 2013). This left them no choice but to stay home or call for help. Many were also living on the highest floors of buildings. When the power was cut off, the elevators often stopped working for days, sometimes weeks, forcing elderly people to stay home in often precarious conditions.

Evacuating nursing homes in the face of Sandy: a tale of mismanagement and lack of emergency preparedness

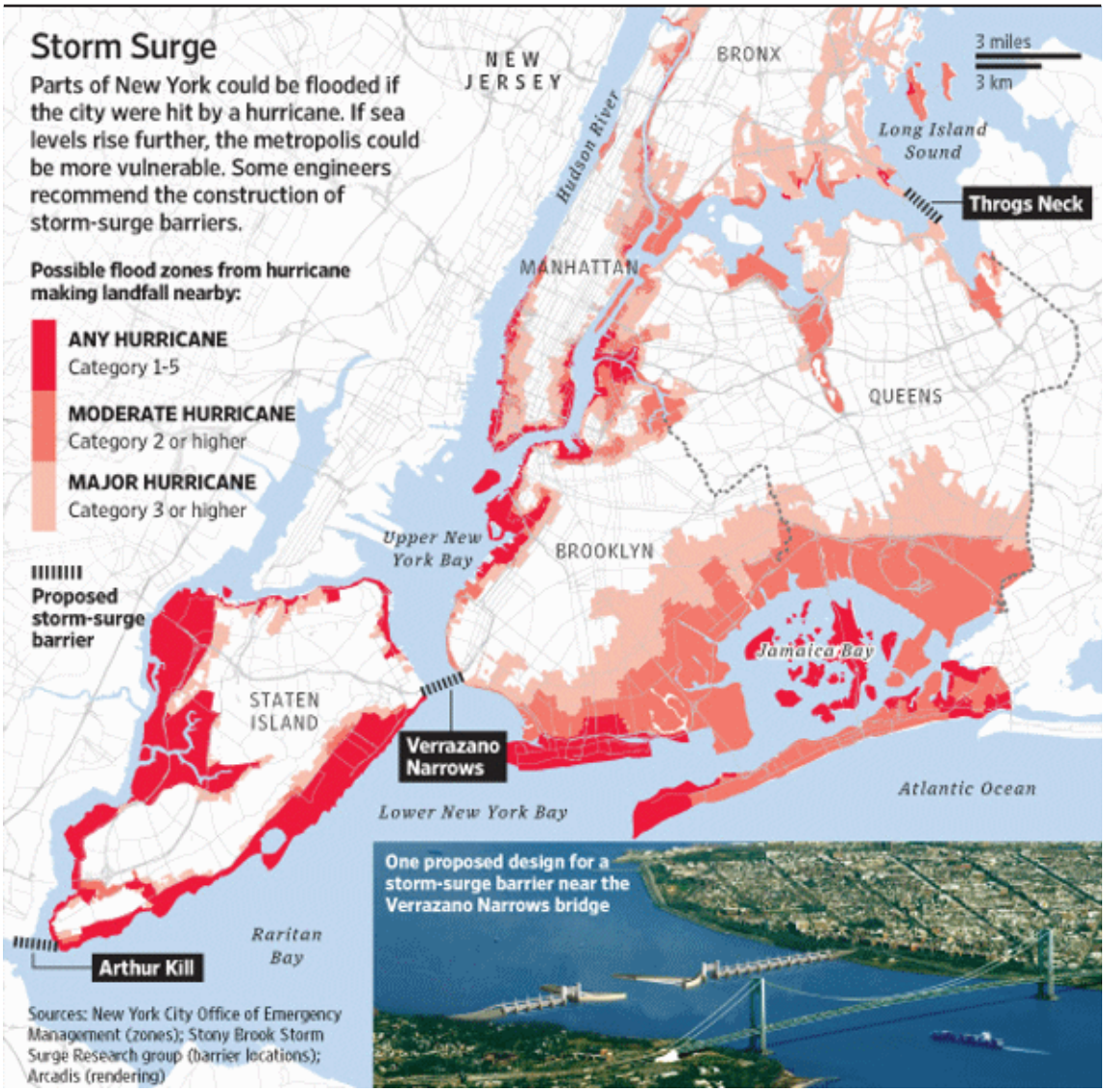
Elderly people living in nursing and care facilities were not spared from the hurricane's damage. A few days before hurricane Sandy made landfall, Mayor Bloomberg advised 40 nursing homes located in the mandatory evacuation areas to cancel plans to move their 3,000 residents to safety (Preston, 2012). This decision was influenced by the past experience of Hurricane Irene in 2011. At that time, officials had ordered evacuation of nursing and adult homes in specific zones. While the hurricane finally caused minor damage, the cost of evacuation in terms of transportation, health care, and housing amounted to millions of dollars, leading to broad criticism. Some nursing homes had still not been reimbursed for Irene's evacuations at the time of Sandy's landfall. Furthermore, the evacuation of nursing and care homes had proved difficult and dangerous to the physical and psychological health of the residents. However, this time around, the decision not to evacuate had disastrous consequences. By the time the intensity of the storm became clear, and the surge projection rose from 1.8 to 3.4 meters (Wunderground, 2012), it was too late to evacuate elderly people, which is a 48-hour process. Nursing homes were then ordered to increase staffing and to transfer the residents who required ventilators to hospitals.

In addition to this lack of caution by NYC authorities, the effects of the hurricane on nursing home residents were worsened by the default in emergency preparedness in the facilities. First, emergency backup generators are not legally required to be able to withstand flooding, as health inspectors only check that they are functional, but not whether they are protected against flooding. When Sandy hit, the waters rose so quickly that the workers in the facilities did not have time to elevate them. In Queens and Brooklyn alone, over 23 nursing homes were severely flooded, leading to heat and power to go outin many cases (Preston, 2012). Elderly people therefore had to ride out the storm within the nursing homes, and were later on forced to evacuate after the surge, due to the absence of electricity. In the days following the storm, 6,300 patients were evacuated from 47 facilities according to the New York State Health Department (Durkin, 2013). These examples highlight the importance of emergency preparedness of nursing homes themselves, as facilities where generators were protected from surges, like Ocean Promenade in Queens, did not have to evacuate after the storm. Evacuees were taken to other facilities, but also to high schools converted to shelters, often quite far away--even as far as Albany. They were sometimes sent without their medical records or medications, to places that were not specialized for nursing home care. Furthermore, the evacuation flows caused residents from facilities dealing with specific illnesses to be mixed with residents from "normal" nursing homes, causing a great deal of confusion and psychological damage for many (Preston, 2012). Some of the 160 residents evacuated from Bell Harbor in Queens had, for instance, been diagnosed with only slight psychiatric illnesses, but during the evacuation they were mixed with residents who had more severe disorders, and were brought to the Milestone Residence where they were obliged to adopt a much more institutional lifestyle (The Associated Press, 2012). In December, two months later, hundreds of nursing home patients were still displaced, living in temporary, overcrowded quarters, sometimes without a regular change of clothes. The Bishop Henry B. Hucles Nursing Centre in Brooklyn was for instance full at nearly twice its licensed capacity (The Associated Press, 2012).

The confusion was magnified by the fact that the floods cut off phone lines, disabling facilities from fulfilling a major requirement: notifying relatives. Communication continued to be chaotic up to a week after Sandy hit New York, as many families still were not aware of where their elderly family members had been evacuated, or of their health status. No clear indications had been given as to which phone number should be called to obtain information, and many relatives were directed to the wrong shelters (Hallman, 2012).

The disproportionate impact of the storm on the elderly was caused by this group's intrinsic vulnerabilities, but also by the insufficient preparedness at the state, local and facility level. The fact that structures designed for this particularly vulnerable group were allowed to be located in low lying areas illustrate a sense of invulnerability of New Yorkers and authorities to environmental disasters.

Figure 2. Surge barrier projects



Sources: New York City Office of Emergency Management (2012)

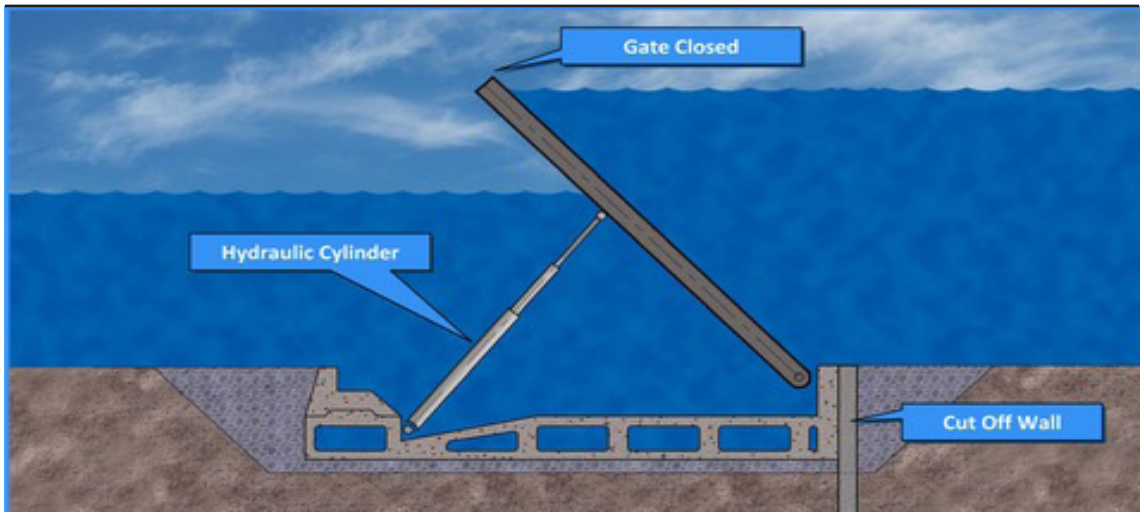
The authority's reliance on hotels highlights that the emergency disaster management and recovery mechanisms did not take into account the radical impact of income differences on displacement. New York authorities failed to immediately differentiate the needs of the displaced according to their income level, causing a "tale of two Sandys", with lower-income displaced people remaining in precarious living conditions for a much longer length of time than households of higher means.

3. REBUILDING AND ADAPTING: A POLICY PATH FOR SANDY'S AFTERMATH

3.1. Action at various levels

Climate change adaptation needs to happen at different scales. At the household level, it could mean thinking in a vertical manner, a certain flood requirement level and flood-proofing all the lower floors, with all essential utilities at higher floors (Solecki, 2013). Building defensive systems is building resilience into public structures. For nearly 100 years, officials have tried to compensate the erosion of shorelines due to natural causes by building hard structures such as seawalls and

Figure 3. Flap-type barrier model



Source: Parsons Brinckerhoff, PBS Newshour (2012).

bulkheads. Experts use the term "New Jerseyzation" to refer to such structures now present on 80 per cent of the shoreline of New Jersey (Rudolf, 2012). Although sea walls are particularly well-known for their use in the Netherlands, they can actually be found much closer to New York: in Stamford, a city of 124,000 on the East Coast (Navarro, 2012). A five-meter high barrier was built in 1969, protecting an area of about 2.4 square kilometres. The Army Corps of Engineers estimated that it helped prevent USD 25 million in damage to houses and businesses (Navarro, 2012). Such successful examples have attracted the attention of engineers and authorities, which have considered applying similar systems to protect New York. Three main projects were presented in 2009 at the American Society of Civil Engineers conference, to protect New York against Category 3 hurricanes. One of the designs represented a rolling gates system, north of the Verrazano-Narrows Bridge connecting Long Island and New Jersey. The USD 6.5 billion project envisaged a complex system of various gates which could be closed during a storm to prevent flood surges to affect the City and parts of New Jersey, and could sustain a surge of nine meters –twice as high as Sandy- (Jacobson, 2012). In normal situations, it would still allow the water to pass, in order to limit the disturbance on the ocean's tides and on the heavy commercial boat traffic.

A second design proposed, in addition to the previously mentioned sea wall, the creation of a flap-type barrier at the upper East River. The sea-wall would include a number of panels that would rest flat on the ground below the water, and could be raised in the case of a surge. This would limit the disturbance for boat traffic as well as to the local marine life, while being high enough to act as a buffer against storm surges of a Category 3 hurricane (Jacobson, 2012). An advantage of this design is that it could be built off site before being laid down in the river, thereby reducing the costs and economic and wildlife disruptions. However, such plans would force local areas to build draining systems to deal with water flooding over the banks on the sides of the gates (Jacobson, 2012), amounting to an added cost of around USD 10 billion to USD 12 billion to shore up the areas on the sides of the barriers (Navarro, 2012).

In addition to being quite costly, such sea wall plans also reflect a somewhat short-term adaptation view. Indeed, even after the debate is won and politicians line up behind the project –Congressional approval will be needed--funding, acquiring permits and conducting environmental studies would be a lengthy process. The construction would very likely not begin in the next two decades, leaving New York vulnerable in the meantime (Peltz, 2012). Furthermore, it would only provide protection for 50 to 100 years, as sea levels continue rising (Parry, 2013). Sea wall construction projects also assume that current climate change, sea-level rise and hurricane size predictions are accurate. These models are debatable because of the global scale and complexity of climate change. Indeed, meteorological estimations of Sandy's development as it moved towards the East coast have proved to be very hesitant at best, highlighting that there is still much to improve in this area. One can thereby wonder whether sea walls built on current projections will still be able to withstand floods and hurricanes that will have evolved in size and scope in the coming decades.

The barriers' limitations are also evident in the shorter term: an important question is whether they would be socially fair, as they would cause water levels on the other side to rise approximately one foot (30 cm), possibly worsening flooding in these areas –the water level could be around 20 per cent higher on the other side of the barrier (Navarro, 2012). Furthermore, barrier plans are likely to raise objections from industries arguing against the large disruption in the city's waterways, as well as from residents objecting to the destruction of the natural landscapes. Barriers would also reduce the exchanges of New York's estuarine waters with the sea, worsening water quality and modifying temperatures and salinity, with potentially negative impacts on rebounding ecosystems and local fisheries (Jonkman, 2012) that benefit the area both economically and in terms of recreation. Such policies could create a false sense of security that blinds New Yorkers from the increasing risk, and thereby prevent authorities from searching for smaller, more flexible and more efficient solutions (Gessner, 2012).

3.2. Learning from the past while preparing for the future

It can be argued that a series of minor interventions will lead, over time, to efficient and more natural systems to deal with climate change and sea-level rise (Peltz, 2012). In recent years, the armouring of the coast against erosion has for instance been supplemented by beach replenishment systems (Wald, 2013). An obvious policy would be to disaster-proof infrastructure, to increase their resiliency against natural disasters. A large part of Sandy's damage could have been avoided by adaptive measures such as burying power lines in the suburbs and designing closing doors for subways (Lind, 2012). This point highlights that recovering after Sandy is not enough, the city needs to rebuild in a way that decreases the risks of future damage. Populations need to return to a new normalcy, where they are actually in a better situation than before. Authorities cannot only learn from the past anymore, they have to take into account climate change related projections, including those of sea-level rise (Solecki, 2013). Although efforts to increase resilience have been launched in the past, they were usually conducted with a short-term view. The National Flood Insurance Programme Community Rating System, for instance, was introduced in 1990 to encourage local authorities to upgrade buildings' structures to decrease the risk from floods, in exchange for deductions on residents' flood insurance premiums. The large majority of the 1,211 communities that voluntarily participated in the programme received minimal ratings from federal agents, which means that local authorities had implemented the lowest level of adaptation measures to prevent flood damage (Rudolf, 2012). Floods due to hurricanes like Sandy are not just "natural disasters," they are failures to adopt and implement adequate land use and building code requirements.

Flood-proofing subway and road tunnel systems in coastal areas (Jonkman, 2012), while adopting more nature-friendly barrier systems such as rebuilding the harbour's salt marshes and oyster beds, that once acted as softener against storms (Jacobson, 2012 and Jonkman, 2012) could go a long way to increase the city's resilience. As Mayor Bloomberg declared after hurricane Sandy: "What we have to do is learn, and it would be great if you didn't put your generators in the basement… The fact that we live close to the water shouldn't be a surprise to everybody." (Chaban, 2012).

3.3. Relocation, the key to adaptation?

A longer-term adaptation method would be to encourage the relocation from low lying areas, to higher regions in Queens and Staten Island that are currently scarcely populated. In addition to mitigating the impacts of future storms, such measures would be more cost efficient than to repair structures after every storm. This could be achieved through economic incentives, with higher taxes for businesses and residences in vulnerable areas, and tax incentives for those who move elsewhere (Young, 2013). In the past, many coastal towns such as Long Branch in New Jersey actually granted tax abatements for real estate developers to relocate there. Hurricane Sandy has sent the clear message that this type of policy needs to be reversed. Many residents in Staten Island for instance have been seeking government buyouts to be able to relocate to higher areas. People whose homes were destroyed or badly damaged in flood-prone areas are not inclined to stay and rebuild, either out of fear that the increasingly frequent storms will take their houses every time or because they have been too emotionally affected (The Associated Press, 2013). This is the case in Oakwood Beach, an area that has been rapidly developed in the last century, and was particularly hit by the storm. In February, Governor Mario Cuomo launched a programme through which homeowners in the area could sell their houses at their pre-Sandy market value. To date, In the Fox Beach section of Oakwood Beach, 133 of 165 households have signed up to take a buyout if one becomes available (Kaplan, 2013). Nevertheless, as the focus has been on rebuilding

rather than retreating, residents will have to pressure authorities to obtain additional funding for buy-outs, for instance, through the Federal Emergency Management Agency's Hazard Mitigation Grant Programme, that was used after Hurricane Irene. It remains to be seen whether the will to relocate permanently is reflected in the majority of coastal populations, or if it was solely a short-term post-storm reaction from a small share of coastal residents.

Another method to induce relocation from low-lying areas would be to increase insurance costs. Before Sandy, coastal areas benefitted from low insurance costs, which gave homeowners a false sense of security. Increasing the individual costs of living in low-lying areas would enable to transfer more of the risk burden to property owners, improving popular risk perception. In 2010, an official report by the city's Panel on Climate Change highlighted that New York authorities should "reduce incentives that increase or perpetuate development in high-risk locations." (Rudolf, 2012). However, this proposal was not adopted by the city, that feared that in would lead to a policy of disinvestment and would encourage relocation away from current urban regions, resulting in disastrous impacts on the economy. Authorities underlined that the FEMA's zone with 1 per cent risk of flooding in NYC was populated with over 210,000 persons, and provided for almost 190,000 jobs (Rudolf, 2012).

The example of Ocean Country is quite revealing. It was one of New Jersey's most rapidly developing areas in terms of population density, with a total population growth of over 69 per cent between 1980 and 2010 (J. Rudolf, 2012). Landscapes that used to act as natural buffers against storms were destroyed and populated. This county, which issued the highest number of coastal residential building permits in 2010, was also one of the most devastated by the flood. Real estate representatives have a large influence in the politics of New Jersey and New York, as they have been major donors to governors and local leaders, ranking among the top contributors to New Jersey Governor Christie (Rudolf, 2012). Before Sandy, there was no provision in these states laws requiring in-depth review of developments on coastlines, nor for buildings to meet reasonable storm and flood resistance standards. Small developments of fewer than 25 units in vulnerable areas did not require any form of state approval, leaving the decision to local officials. This was specifically the type of projects that were designed throughout the 1970s, 1980s and 1990s, as local officials were more eager to develop their localities in the short term than to adopt a sustainable long-term view (Bernstein, 2012). Officials in localities that lacked funds have tended to prioritize short-term economic benefits, especially since many are elected for two-years terms. This lack of action on the part of authorities highlights the tension between the objectives of development and environmental protection for many localities (Bernstein, 2012).

CONCLUSION

Hurricane Sandy was a partly political disaster, caused by the lack of adaptation and mitigation measures. Authorities had received many warnings about the high risks of hurricanes, as early as 1992 when environmentalist Suzanne Mattei analysed the worst-case scenario of a "combined sea-level rise/storm surge event" (Rudolf, 2012). However, the federal government, the State of New York as well as the City generally did not conduct proper adaptation programmes.

Hurricane Sandy has shown that economic development and environmental protection are not at odds and can be improved together. Political will needs to be stirred up now, so New Yorkers do not have to live through multiple Sandys before officials act. Taking projects beyond the research/development phase would allow them to be fully funded and implemented through cooperation between federal, state and local authorities, as well as the private sector. The environment cannot be considered a stable variable in New York's urban planning anymore (Funkhouser, 2012), and migration from low-lying areas would be a particularly efficient adaptation strategy to increasing climate risks in New York. Resilience, mitigation and adaptation can be combined to protect New Yorkers from the impact of future natural disasters. In some cases, the cost of staying in low lying areas surpasses the cost of relocating, as households face higher insurance premiums (Holborn, 2012), and have to raise their houses higher above sea-level, at an approximate cost of USD 10,000 to USD 100,000 for the entire house (Harris, 2013). Although there is no legal obligation to lift houses in New York City, it is recommended to elevate them as a protection from future storms. Hurricane Sandy has changed cost-benefit calculations, and this should be an opportunity for authorities as well as communities to adapt in a sustainable way.

Although resilience and adaptation are important objectives, New York authorities and inhabitants could also improve their preparedness to natural disasters. Responses to all phases of evacuation and displacement can be enhanced, in order to avoid the confusion and lack of organization that followed Sandy. The authorities'

preparedness and emergency response system was not efficient enough to deal with the immediate human displacement consequences of Sandy, as shown by the low level of pre-storm evacuations, as well as the precariousness of the shelter system, highlighting the dire lack of space for New York City to welcome displaced persons. As hurricanes become stronger and more frequent, authorities could also improve their policies targeted at particularly vulnerable groups such as the elderly and the low-income households. Services such as special phone lines for the elderly would be useful, to enable them to call for help if they do not have any family or friends help them to safety. Past censuses could be particularly used to identify the areas where many vulnerable people live, enabling authorities to increase their activity and presence in such places in the case of a natural disaster – particularly before the disaster strikes.

Responses to long-term displacements have yet to be created to deal with displaced families whose houses have been destroyed. Many programs were created after Sandy hit without proper coordination or prior reflexion, leading to uneven and often poor responses. The FEMA's hotel program is a perfect illustration.

Finally, the efficiency of preparedness, resilience and adaptation measures relies on the authorities' communication strategy. In terms of preparedness, enhancing the communication with communities and households would allow for easier and more efficient management of evacuations, through a better awareness of evacuation zones, of the risks involved, and of available means of transportation. Working with local associations, NGOs and religious groups, among others, could prove extremely useful –many households are more likely to be persuaded by their local pastors than by official messages on T.V. Improved communication with local communities is also fundamental in the adaptation process, for three main reasons. First, locals can prove very useful to develop efficient adaptation measures, as they usually know their locality and its geographical and demographical characteristics very well. Second, involving communities in the process and taking their concerns into consideration increases the chances that they will support the final decision. Everyone having a say in the debate makes improves stakeholder sense of ownership Third, promoting conversations and debates on the issue increases the population's awareness of the risks, making them more likely to make sound, long-term decisions rather than short-term ones based on pre-conceived notions or political inclinations.

Migration——and more precisely displacements and relocations—has been one of the main, and yet least-reported, consequence of Hurricane Sandy. It has been essential to the short-term response and remains crucial to the long-term adaptation process. Technology, high income levels and stable institutions are likely to mitigate the consequences of disasters. However, the centrality of migration during and after Hurricane Sandy highlights that environmentally-induced displacements are not restricted to developing countries or to lower-income cities like New Orleans, as natural disasters strike regardless of the level of development. The impacts of Hurricane Sandy furthermore underscore that relocation is not necessarily a consequence of disasters, but should also be considered as an opportunity to adapt to a changing world, through relocation to safer, less vulnerable areas.

Picture 1. After hurricane Sandy

Source: Coastal America, 2013.

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IN FOCUS

Migration and the Environment: The case of Hurricane Sandy in Haiti

Juliette Cody

From 23 to 26 October 2012, the western and southern regions of Haiti were heavily affected by Hurricane Sandy. After a drought and Tropical Storm Isaac, Hurricane Sandy was the third natural disaster to strike the country in 2012. Haiti was still recovering from the lingering impacts of the 2010 earthquake. Over 347,000 people remained in 450 Internally Displaced Persons (IDP) sites – i.e. camps and more ad-hoc facilities hosting evacuees - at the end of 2012 (IOM 2013:1). Cholera, gender-based violence, and food insecurity, among other issues, remained prevalent.

Preparedness and preventive evacuation

Prior to and during Hurricane Sandy, the Government of Haiti issued successive Orange and Red Alerts and activated the National Risk Management and Disaster Plan (PNGRD) (FAO 2012:3). The Haitian Government, led by the Civil Protection Directorate and with the support of the Haitian Red Cross, Haitian Civil Society and international partners, worked to put into practice a preparedness strategy, involving awareness-raising among vulnerable populations to natural disasters and a "newly-developed system of short-term, preventive evacuation" for the Port-au-Prince metropolitan area, building on the success of the first preventive evacuation organized in response to Tropical Storm Isaac (Mellicker 2013:1). Implementing such a strategy was initially challenged by the reluctance of a few international actors and vulnerable people to evacuate (Gitau 2013). There were concerns that it would lead to long-term displacement or increase insecurity and theft. None of these scenarios took place and the preventive evacuation was considered to be successful, thus earning support both from the evacuees and the international partners. The Haitian National Agencies maintained leadership and received assistance from their international partners, which were extensively involved in funding and building the shelters used for preventive evacuation. The international community also supported evacuations and provided the evacuees with humanitarian assistance to meet their basic needs. Over 20,000 people would have been evacuated to 136 shelters (IOM 2012, p1). Some vulnerable families also evacuated to other types of shelter, for example, with host families. Most evacuees left the shelters in the days after the passing of Hurricane Sandy (Mellicker 2013[1]).

Migration as a response to damaged homes and livelihoods

Despite evacuations, Hurricane Sandy heavily impacted the Haitian population. Severe flooding and landslides resulted from the violent winds and heavy rain and caused immediate and significant damage to houses, public infrastructure and crops. The combination of Hurricane Sandy, the drought and Tropical Storm Isaac led over 3.44 million people to be affected by food insecurity (IOM 2013:2).

The housing damage resulted in internal displacement, as over 33,760 families, including 7,450 families already in IDP camps, lost their homes. Most of these people were accommodated by friends, family or neighbors. Others stayed in evacuation shelters. Over 2,000 of these people could not return home as their houses and lands had been destroyed and did not have access to alternative shelter solutions (FAO 2012:7). They stayed with families, friends or in temporary shelters at the site of their destroyed houses for several months, until they were able to rebuild or repair their houses (Mellicker 2013[2]).

There is a general consensus that, on the long run, Hurricane Sandy's most important effect on migration relates to food security (Mellicker 2013[3]). In order to cope with the severe damage inflicted on agricultural output, crops and cattle, some people used migration as a positive adaptation strategy, moving to less affected rural areas or to urban areas. It is also assumed that migration towards the Dominican Republic increased significantly (Gitau 2013). No mechanisms so far have tracked these population movements and it is therefore hard to evaluate the numbers of people concerned.

Conclusion

The success of the strategy implemented prior to and during Hurricane Sandy in Haiti demonstrated the importance of preparedness and preventive evacuation to decrease vulnerability. It underlined the necessity to consolidate such strategies by improving disaster preparadedness-mechanisms such as tracking mechanisms, monitoring, and alert raising systems. The damage resulting from the storm also emphasized the need for mitigation measures, as well as the necessity to limit environmental degradation in Haiti.

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TYPHOON BOPHA AND PEOPLE DISPLACEMENTS IN THE PHILIPPINES

ULRIKE JULIA WENDT

1. INTRODUCTION

Typhoon Bopha, locally known as Pablo, made landfall in the southern part of the Philippines on 4 December 2012. It was not only the sixteenth and strongest typhoon that hit the country in 2012, but it was also the most powerful and southern typhoon that was recorded in the Western Pacific in the past 100 years, a worrying indicator how climate change could affect the Philippines in severe ways (IOM Philippines, 2012). Considering that the Philippines is a country familiar with natural disasters and consequential people displacements, this paper examines the extent to which Typhoon Bopha has caused large-scale displacements of people and significantly contributed to decreased standards of living. In so doing, the paper will refer to "displaced people" as those who have been forced or obliged to leave their homes as a result of the threats or impacts of Typhoon Bopha.[1] This comprises of people who were evacuated or fled by themselves before or after the onset of the event. It also includes situations where people lost their homes or livelihoods and now stay in different sites (Yonetani 2013: 10).

The first section of the paper will provide a short background about the Philippines' long history of environment-induced displacements. It then elaborates on Typhoon Bopha and its detrimental impacts, which forced many people to leave their homes before and after the storm. The next section examines these displacements in greater detail. Subsequently, a critical study of the major policy responses that have been implemented to address the particular needs of the displaced population will follow. It is important to note that, at the time of writing in 2013, policy responses are still being implemented and are changing. Policy recommendations are discussed in the conclusion.

1. The description used in this paper to identify "displaced people" is informed by the United Nations Guiding Principles Document that defines Internally Displaced People (IDPs) as "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 in order 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". This paper refers to people that were displaced due to Typhoon Bopha without differentiating between those who have been displaced internally or across border. The available data suggests that the majority of people displaced due to Bopha have been displaced internally.

2. THE PHILIPPINES: A COUNTRY FAMILIAR WITH NATURAL DISASTERS AND CONSEQUENTIAL PEOPLE DISPLACEMENTS

The Philippines is one of the most disaster-prone countries in the world. According to the *World Risk Report 2012*, it was ranked third out of 173 countries, meaning the third most exposed and vulnerable country to disasters (Alliance Development Works, 2012: 18). Between 1990 and 2009, 237 natural disasters occurred in the country, which is nearly a third of the total number of disasters that occurred in the South-East Asian region in this period (GFDRR, 2011: 305). Typhoons are the most common and detrimental disasters. Between June and December, an average of 20 typhoons hit the country annually, usually accompanied by intense rainfall and flooding, causing the death of hundreds of people and damaging the country's economy significantly (GFDRR, 2011: 306).

2.1. The Philippines geographical vulnerabilities

Natural disasters strike the Philippines due to various reasons. Its geographical situation contributes to the high vulnerability that is further exacerbated by the risks resulting from climate change. In fact, the Philippines have recorded its most detrimental, largest and deadliest typhoons in the past 17 years (GFDRR, 2011: 307). Furthermore, environmental degradation has increased the country's risks of disasters. Poor land-use, planning and population growth contribute to the enormous damage of the environment and lead to the deforestation of large regions (GFDRR, 2011: 307). As a result, landslides and flash flooding have increased and some areas that have significantly lost their woodland have become more vulnerable to the damage caused by typhoons (GFDRR, 2011: 307).

The high occurrence of natural disasters has caused the displacement of millions of people in the Philippines. Between 2008 and 2012, more than twelve million people were displaced due to natural disasters (Yonetani 2013: 31). After Typhoon Washi, locally known as Sendong, hit the country in December 2011, about 54 per cent of the population of the city Cagayan de Oro and about 34 per cent of the population of the city Iligan in the country's southern part were displaced (Ginnetti et al., 2013: 7). Clearly, these numbers help explain why the Internal Displacement Monitoring Centre (IDMC) and the Norwegian Refugee Council (NRC) have identified the Philippines as one of the countries with the highest number of people displaced due to natural disasters. In 2009, they have ranked the country third; in 2010, seventh; and in 2012, fourth (Yonetani, 2011: 9, 12, 16; Yonetani 2013: 31).

A number of factors highly increase the risks of the displacement of people. For example, homes and buildings are often not built to the same standards as in developed countries (Ginnetti et al., 2013: 7). Consequently, the risk of them being destroyed is far greater and can lead to the people's displacement. Poor urban governance and weak political accountability are the underlying reasons for this because they often lead to unsuccessful and/or unenforced land planning and building standards (Ginnetti et al., 2013: 7). Furthermore, Ginnetti et al. (2013: 7) cite that a lack of understanding of the effects of climate change and unsatisfactory early-warning systems for natural disasters contribute to the country's high risk of people's displacement.

2.2 Policy adaptation to the high level of risks

Given this high risk of natural disasters and its consequences on people's displacement, the Philippines have enacted a variety of policies and legislations on disaster risk reduction (DRR). In fact, similar efforts have a long history in the country. As a colonial power starting in the 16th century, Spain set up a record system to keep information on environmental events. Interestingly, the records of the environmental events that occurred between 1521 and 1898 have informed today's early warning systems (Ginnetti et al., 2013: 17). Since the end of the 19th century, laws on disasters associated with natural and human-induced hazards and institutions on disaster management have increasingly been enacted. In 1978, President Marcos issued Presidential Decree 1566 that remains the basis for the country's disaster management (Ginnetti et al., 2013: 17). Since 2005, the Philippines have supported the Hyogo Framework for Action (HFA), which is a ten-year plan that aims to explain, illustrate and specify the work that is needed from different fields and stakeholders to better address issues related to disasters (NDRRMP, 2011: 10). In 2010, the Filipino Government signed the Philippines Disaster Risk Reduction and Management Act (PDRRM) that aims to reform the country's main laws and policies in line with the HFA (Ginnetti et al., 2013: 17). In order to specifically address issues related to Internally Displaced Persons (IDPs), the country has formulated a number of laws and bills, such as a bill to protect the rights of IDPs that was passed in February 2013 (UNHCR, 2013). The PDRRM has since included a provision on IDPs as well (Ginnetti et al., 2013: 18).

Despite the governmental attention given to DRR and IDPs and the consequent adoption of domestic policies based on international standards, Typhoon Bopha has caused large-scale people displacements and significantly contributed to their decreased standard of living.

3. THE TYPHOON AND ITS DETRIMENTAL IMPACTS

3.1. Formation and path of Typhoon Bopha

The origins of Typhoon Bopha were first sighted around 26 November 2012 (Gutro, 2012). Bopha formed in an uncommon and distinctive manner because it developed fewer than five degrees north of the equator (Met Office, 2012). This is an area where tropical storms do not typically emerge due to the low Coriolis force that helps typhoons to form by causing their rotation (Haeseler, 2012). In the following weeks, Bopha steadily increased in its size and intensity. On 3 December, it hit the southern part of the Palau archipelago (around 1,000 km east of the Philippines) where it devastated several areas, caused power outages but no casualties (OCHA, 2012a).

On 4 December at 4.45 am, Bopha made landfall over Bagaga in Davao Oriental, which is in eastern Mindanao in the southern part of the Philippines (NDRRMC, 2012). Bopha recorded wind strengths of about 185 km/h in its center, gusts of up to 220 km/h and rainfall of 15-30 mm per hour within its diameter of 700 km (IOM Philippines, 2012a). This was three times the wind strength and twice the rainfall than Tropical Storm Washi had brought to the Philippines in 2011 (OCHA, 2013: 11). In the following days, Bopha traversed the landmasses

Map 1. The path of Typhoon Bopha

Source: OCHA 2013: iv. Map provided courtesy of the UN Office for the Coordination of Humanitarian Affairs. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

of Mindanao and turned north while it weakened (NDRRMC, 2012). As noted earlier, Bopha moved along the most southern course of a typhoon that has been recorded in the Western Pacific in the past 100 years. Bopha was downgraded to a tropical depression when it left the Philippine area on 9 December (NDRRMC, 2012). The typhoon's great strength and its uncommon trajectory was a major reason why it had a detrimental impact on the Mindanao region and its population.

3.2. Affected regions

With high winds along coastal areas, mudslides in highland villages and flash floods in low-lying areas, Bopha damaged vast regions during its course through Mindanao (Shelter Cluster, 2012). In particular, it affected the eastern part of the island, which is one of the poorest regions of the Philippines. About 6.9 million people live in this area that encompasses the Davao and Caraga region (OCHA, 2013: 9). Out of the country's 17 regions, these regions are respectively the 7th (113 persons per square meter) and 13th (220 persons per square meter) most populated areas (National Statistics Office 2012). Specifically, Bopha had detrimental effects on the provinces of Davao Oriental, Compostela Valley, Suriago del Sur and Agusan del Sur, each of which it destroyed and impacted in their particular way. For example, Davao Oriental especially suffered from the damages to its agricultural lands and Compostela Valley experienced a particularly high number of casualties.[2] The high level of deforestation that characterized Mindanao before Bopha may have contributed to the extent to which these effects were so damaging (Morrison, 2013).

3.3. Human cost of Bopha

Bopha affected over 6.2 million people (OCHA, 2013a: 35). According to the Inter-Agency Standing Committee (n.d.), this includes "all people whose lives have been affected in some way by the crisis" beyond those in need of humanitarian assistance. More specifically, the typhoon left 1,146 people dead, 834 missing and 2,967 injured (OCHA, 2013e, OCHA, 2013a: 35). These numbers have constantly and drastically risen since Bopha hit the country on 4 December. The reported number of affected people increased from about 60,000 on 4 December, to 5 million on 6 December, and to 6.2 million on 18 December. Similarly, the number of people killed increased from about 95 on 5 December, to 456 on 7 December and to 1,043 on 18 December (IOM Philippines, 2012; OCHA, 2012b; OCHA, 2012c; OCHA, 2012d; OCHA, 2012e). Many factors explain this increase in numbers: it took several days until Bopha completely left the country and thereby killed people in the days after 4 December. In addition, Bopha hit many remote communities where it was challenging to obtain comprehensive data on causalities.

Bopha affected various specifically vulnerable groups. Some reports revealed that up to 40 per cent of the affected population lived below the poverty line (Protection Cluster, 2013). Poor people were often dependent on income generating activities, such as subsistence farming, and lived in houses built with less robust materials (IFAD, 2009: 1). Given that Bopha particularly destroyed farmland and housing, which will be later explained in greater detail, poor people were exceptionally vulnerable to the typhoon. Other reports using different criteria to identify the most affected people disclosed that more than 60 per cent were indigenous people (Protection Cluster, 2013). Indigenous people frequently live in the isolated regions of Mindanao. Therefore, they may not have been informed early enough to evacuate before Bopha's landfall and were less likely to obtain humanitarian assistance in a relatively quick manner (Protection Cluster, 2013). Women and children also belonged to the most affected groups. UNICEF (2012) reported that about one third of all affected people were children. They often experienced profound stress due to the death or injury of their loved ones, which can have significant effects on their well-being and future development (UNICEF, 2012). Furthermore, many women were affected because they had become the main provider for their family. Their men had often left after the storm to look for employment elsewhere (Protection Cluster, 2013).

3.4. Agriculture damages

Bopha had devastating impacts on the agriculture of eastern Mindanao. National authorities reported that thousands of hectares of banana and coconut plantations were destroyed, mainly in the provinces of Compostela Valley and Davao Oriental (DSWD et al., 2013). Small growers were particularly affected and had lost between 30 and 50 per cent of their total farming areas (DSWD et al., 2013). The overall damage costs to agriculture were estimated to be at about USD 645 million (OCHA, 2012f).

Before the typhoon, the majority of the population of eastern Mindanao was dependent on subsistence farming of basic commodities, including coconuts, bananas and rice (OCHA, 2013: 9).

2. Interview with IOM Communications Specialist, conducted on 24 March 2013 via Skype.

Picture 1. Aftermath of Typhoon Pablo (Bopha)

Credits: Cateel, Davao Oriental, Creative Commons, Photo: Sonny M. Day, 5 December 2012. Available: http://www.flickr.com/photos/89715795@N02/8289315117/in/photostream/, Accessed: 27 August 2013., Accessed: 21.05.2013.

In addition to growing parts of their own food, households purchased food items from local markets (OCHA, 2013: 20). However, Bopha had damaging impacts on this mixed food economy. After its landfall, many people were no longer able to grow their own food and buy food from the markets. Not only was their agricultural land completely destroyed, but also market supply chains had been cut off (OCHA, 2013: 20). Furthermore, the damages to agricultural lands contributed to a loss of income for many people. People had to look for other jobs elsewhere to make their living; however, these coping strategies were often not sufficient to cover all food needs (OCHA, 2013: 20-21; DSWD et al., 2013). These detrimental impacts contributed to food insecurity and dramatically increased the need of food assistance. Additionally, given that crops like banana and coconut take years to grow, the gravity of the agricultural damages is tremendous (Shelter Cluster, 2012; OCHA, 2013: 21).

3.5. Housing and infrastructure

The National Disaster Risk Reduction and Management Council (NDRRMC) reported that more than 233,000 shelters were affected by the typhoon (IOM Philippines, 2013). Given that many houses were built with wood and other vulnerable materials, numerous houses lost their roofs or were completely flattened. Yet, it was reported that even iron roofs had been carried through the wind like "flying machetes" (Mullen, 2012). Damages to infrastructure were estimated to amount to over USD 186 million (OCHA, 2013). Power and electricity were only slowly restored in the following months, which may have contributed to communities being slowly informed of the current situation (OCHA, 2013: 10).

3.6. Education, health and safety impacts

Large numbers of schools were destroyed or used as evacuation centers, which made it impossible for many children to attend school (Center for Disaster Philanthropy, 2013). Indeed, the Government was able to re-establish the daily school routine within only one month. However, many challenges remained, such as the lack of electricity, school records and teaching material (OCHA, 2013). Many health care facilities were also destroyed, decreasing dramatically the number of available health care providers in the light of the high number of physically injured and psychologically distressed people (OCHA, 2013). Bopha had also detrimental impacts in regards to safety issues. An increased number of gender-based violence cases was reported (OCHA, 2013b). Additionally, many people, particularly indigenous people, living in the hinterlands were not able to access basic government services, such as

social welfare programs, because they had never possessed birth certificates (Protection Cluster, 2013).

4. THE VARIOUS FORMS AND IMPACTS OF PEOPLES' DISPLACEMENTS

4.1. Preventive evacuations

Before Bopha hit the country, many people had already left their homes to flee the threats of typhoon. Between 30 November and 4 December, national and international disaster authorities encouraged communities to take responsibility for their safety and ordered pre-emptive evacuations in areas that were expected to be hit the hardest (IFRC, 2012; Escalante, 2012, OCHA, 2013: 1). As a response, residents were evacuated or fled by themselves to safer grounds, which included evacuation centers set up in schools, bus terminals and gyms. People also fled to relatives who lived on higher ground to prevent being affected by flash floods and landslides that were expected to result from the typhoon (Escalante, 2012; NDRRMC, 2012a).

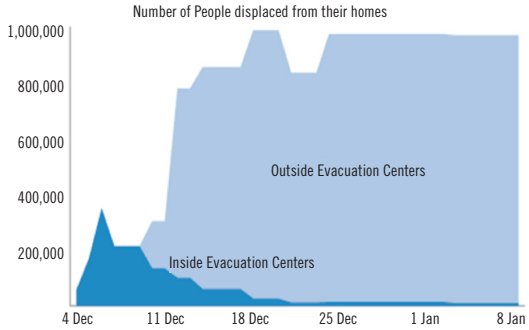
Officials have struggled to measure the scale of the pre-emptive evacuations and escapes. On the one hand, authorities stated that more people had been encouraged to leave typhoon-hazardous areas compared to the previous year when Typhoon Washi hit the country (Mullen, 2012). On the other hand, they emphasized that there were important differences between areas. In the more northern areas, where Washi hit Mindanao, the number of people who left their homes was much larger than in the southern areas, where Washi had not made landfall in 2011.[3] Ortigas (2012) reported that the population in the north had taken the warning signals more seriously because Bopha had been expected to hit this area strongly and people were still traumatized through Typhoon Washi. In contrast, the population in the south paid less attention to the warning signs because Bopha had been expected to hit this region less and people "didn't even know what the warning signals meant (…)" because "typhoons always happen somewhere else, not here (…)" (Ortigas 2012). Eventually, Bopha hit the south stronger than anticipated, causing a higher number of deaths than in the north (Ortigas 2012).

3. Ibid.

4.2. Number and location of people displaced from their homes

The reported number of people displaced from their homes significantly increased after Bopha hit the Philippines on 4 December. Initially, news articles, international organizations and national authorities reported that tens of thousands people had been evacuated or fled by themselves to various evacuations centers (The Telegraph, 2012). The peak was achieved shortly after Bopha's landfall (OCHA 2012d). The reported number of people displaced from their homes further increased to about one million by taking into account people who were inside evacuation centers and outside evacuation centers as Bopha had, for instance, damaged their houses (OCHA 2013). The latest figures report that Bopha induced the displacement of more than 1.9 million people in total (Yonetani 2013: 43).

Figure 2. Displaced People inside and outside Evacuation Centers



Source: OCHA, 2013: 3. Map provided with the courtesy of the UN Office for the Coordination of Humanitarian Affairs. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

More specifically, in January 2013, the Philippines' Department of Social Welfare and Development (DSWD) estimated that, at the height of the disaster, about 150,000 families, or 750,000 people, stayed in about 1,150 evacuation centers (OCHA, 2013: 15). Indeed, these numbers exceed those that the Office of the Coordination of Humanitarian Affairs (OCHA) reported and are illustrated in figure 2. OCHA (2012d) estimated a peak of 348,394 evacuees staying in 541 evacuation centers on 6 December 2012. Many reasons could explain this significant difference in data, such as that the DSWD may have used additional sources that were not known to OCHA in December 2012.[4]

4. Personal communication with OCHA Head of Office, conducted on 30 June 2013 via email.

Evacuation centers were increasingly established in different locations, including local government buildings, gyms and stadiums (OCHA, 2013: 15). Soon after Bopha had hit the country, the number of people who stayed in these evacuation centers started decreasing (IOM, 2012a). By February 2013, less than 9,000 people remained in about one hundred evacuation centers (OCHA, 2013e).

Many factors explain why these numbers started declining quickly. First, numerous families wanted to return to their homes to start rebuilding their houses and save whatever they could (IOM, 2012a). Second, many people left because of the bad conditions that often prevailed in evacuation centers. Many centers were overcrowded and could not provide adequate protection that people required, such as material for emergency shelters, adequate sanitation and potable water (IOM, 2012a). Several evacuation centers were also roofless after having been hit by the typhoon and some evacuation centers in Compostela Valley were badly flooded (IOM, 2012). These conditions also led some people to move to other places, such as to transitional sites (IOM, 2013).

Transitional sites included tent cities and bunkhouses that were set up immediately after the typhoon in order to provide a sanctuary for displaced people. By March 2013, IOM Philippines (2013) reported that 190 bunkhouses were built in Davao Oriental and Compostela Valley. The construction of bunkhouses mainly happened under the control of national authorities, with the financial and technical support of international and national humanitarian organizations and the assistance of local people who were hired to build these houses (IOM, 2013; OCHA, 2013: 49; OCHA, 2012d).

However, transitional sites were a highly controversial topic. Similar to many evacuation centers, transitional sites were often in bad conditions and lacked, for instance, adequate water, sanitation and hygiene facilities (IOM, 2013). In addition, newspapers criticized the construction of bunkhouses and accused the government of managing this process in a corrupt manner (Escalante, 2013). For instance, local newspapers reported that the payments of those who were hired to build bunkhouses were dubious because some workers had received more money than they were entitled (Romero, 2013). Furthermore, the construction of transitional sites had often not been regarded as a best practice. Specialists on post crises and emergency issues noted that efforts should have been directed toward making people stay in their trusted environment so that they can recover as quickly as possible.[5] Transitional sites would disconnect people from their familiar environment, which would make it difficult for them to get back into their normal life once they have left these temporary solutions.[6]

While many people were displaced in evacuation centers and transitional sites, the overwhelming majority, numbering about 925,412 people as of February 2013, remained with host families and in so-called "spontaneous settlements", where people have set up their own makeshift shelters (OCHA, 2013e; IOM Philippines 2013a). This number had stayed relatively consistent from mid-December 2012, as shown in figure 2. However, one may observe a significant drop in the number of people staying outside evacuation centers around 21 December. OCHA had used only data that was available at the time. However, data from some municipalities had not arrived, which explains the sudden drop in numbers.[7] The non-supply of the data could have been due to numerous reasons, such as logistical challenges to obtain data. Spontaneous settlements were mainly found along roadsides, near the original houses of displaced people and in affected communities after the floodwater receded (IOM Philippines, 2013a). While people received similar assistance as those who remained in registered sites, providing the necessary aid to them was more challenging (IOM Philippines, 2013a).

4.3 Migration and trafficking

After 4 December, an increasing number of people left their homes to better deal with the impacts of Typhoon Bopha. In order to cope with the financial difficulties, for example, several people, particularly men, migrated to other areas to look for work. Although this implied that many were separated from their families and usual environments, they saw this as their duty. As noted earlier, women who stayed home consequently emerged as the main provider for their families (Protection Cluster, 2013; UNICEF, 2013). Similarly, adolescent boys and girls started going to cities to look for jobs. Given the high incidence of child labor in the Philippines, this was not considered an unusual phenomenon. However, travelling as child laborers to other regions made children more vulnerable to violence, abuse and trafficking (Protection Cluster, 2013; UNICEF, 2013).

5. Interview with IOM Regional Emergency and Post Crisis Specialist at IOM Thailand, conducted on 28 March 2013 via Skype.

6. Interview with IOM Regional Emergency and Post Crisis Specialist at IOM Thailand, conducted on 28 March 2013 via Skype.

7. Personal communication with OCHA Humanitarian Affairs Officer, conducted 26 June 2013 via email.

Hence, UNICEF (2013) raised the concern that the incidence of trafficking could increase as a result of Typhoon Bopha. Already before Bopha, trafficking had been a common issue in the Mindanao region (UNICEF, 2013). Due to the clandestine nature of trafficking, however, reliable and up-to-date data have not yet been available that would allow better assessment of whether or not the issue of trafficking has increased due to Bopha. Nevertheless, the concern is reasonable because children that resulted from the typhoon are likely to be more vulnerable to child trafficking. For example, the rising number of migrating child laborers due to Typhoon Bopha could add to the issue of child trafficking (UNICEF, 2013). Furthermore, the growing number of women and girls who were left behind or looking for work could exacerbate the problem of sex trafficking. The fact that trafficking increased by about 10 per cent after Typhoon Washi had devastated the Philippines in 2011 indicates that trafficking could intensify (UNICEF, 2013). Consequently, several humanitarian actors have mainstreamed awareness-building programs on trafficking issues amongst governmental officials and regional anti-trafficking networks since Bopha (IOM Philippines, 2013a).

4.4 Return of the displaced people

The question of when and whether displaced people can go back is difficult. Indeed, several people returned to their trusted environment to continue their life, or start a new life, as early as possible. However, even if people were able to return and live in their houses, the conditions in which they live are often very poor. A study conducted by REACH in March 2013 had shown that 46 per cent of families, or nearly a half a million people, lived in houses that were classified "uninhabitable" (Bamforth, 2013; Reach, 2012).

Updated data suggests that, as of 30 April 2013, 11,700 people displaced by Bopha still remain inside evacuation centers and 922,000 outside of evacuation centers (OCHA, 2013a: 10). While many live in tents and bunkhouses, the majority remains in spontaneous settlements (IOM Philippines, 2013). Those who live in spontaneous settlements are often considered more likely to return to normality than people residing in other sites. Many spontaneous settlements are close to the original homes of displaced people where families can live together and the community life can start again (Bamforth, 2013).

Yet, it may take years until all the people will be able to return and live in their homes as it was before Bopha. For example, land tenure issues might complicate whether people will be able to rebuild their houses. Assessments show that many of the worst affected people were living in informal arrangements without any legal documentation on land ownership. However, such documentation is important in order to receive government assistance to rebuild houses; but it may take "some time" to obtain them (Kelly 2013: 4). Additionally, going back to normal will be difficult for everyone who suffered a loss, especially for dependents. Whole communities will also need to be rebuilt to enable a similar life before Bopha.[8] The question of whether the Government will actively support people return to their homelands and, instead, relocate them to less disaster prone areas is of high importance.

5. POLICY RESPONSES AND CHALLENGES

5.1. The questioned efficiency of preparedness measures

Many actions that aimed to prepare for any eventualities related to Bopha started on 30 November 2012 when the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and the NDRRMC began to issue regular updates on the typhoon. Bopha was expected to reach the country by 4 December with wind strength between 100 km/h and 185 km/h. Local authorities also expected that Bopha would have more devastating impacts than Washi and therefore, aimed to intensify preparation and evacuations efforts. (IFRC, 2012; PAGASA, n.d.; OCHA, 2012)

Both governmental and non-governmental actors implemented emergency preparedness actions. This included that PAGASA and NDRRMC classified different regions under different public warning signals. In the view of these signals, authorities directed pre-emptive evacuations of families that resided in areas that were anticipated to be hit the strongest. Furthermore, they advised the population to take precautionary measures, which included cancelling travel and outdoor activities, seeking shelter in stronger buildings, evacuating to safer areas, calling off school classes and staying in shelters until the typhoon completely passed (IFRC, 2012, PAGASA n.d.). Furthermore, humanitarian stakeholders established evacuation centers, pre-positioned relief items and mobilized the emergency responders (IFRC, 2012). People

8. Interview with IOM Communications Specialists, Interview with IOM Regional Emergency and Post Crisis Specialist

generally took the warnings seriously and followed the recommended precautionary measures.

Given the high number of casualties that Bopha caused, it appears that the implemented preparedness measures were insufficient and ineffective. Therefore, one may interogates the extent to which the Philippines could still be seen as a model in addressing issues related to DRR (Ginnetti et al., 2013). However, Bopha happened in a region where a typhoon of such great strength had no precedent. This raises the question as to whether people can be expected to effectively and successfully prepare for something that never happened before and that no one genuinely expected to ever happen.[9]

5.2. Declaration of the "state of national calamity"

On 7 December, after Bopha's landfall, the President of the Philippines signed Proclamation No. 522 to declare a state of national calamity. In doing so, he aimed to speed up the rescue, relief and rehabilitation plans implemented by the national and international humanitarian assistance (OCHA, 2013; Kelly 2013). While President Aquino stressed that government actors would take the lead in addressing the needs that had resulted from Bopha, he also emphasized the importance of a coordinated approach between different humanitarian actors (OCHA, 2013: 1).

5.3. Humanitarian response and the clusters approach

By supporting the UN clusters approach to address the particular needs of the displaced population, the Philippines aimed to strengthen the effectiveness of the humanitarian response by making sure that high standards of predictability, accountability and partnership in all activity sectors were achieved (DRC, n.d.). Needs assessments were conducted by national authorities in cooperation with other humanitarian organizations and completed on 5 December (OCHA, 2013: 1, 15) and identified key clusters to be implemented - camp coordination and camp management (CCCM), early recovery, food security and agriculture (OCHA, 2013). The clusters approach was implemented at the regional, provincial and municipal levels on a needs basis. This was significant given that the majority of the local governments in the affected areas had little experience in addressing both natural and man-made disasters (OCHA, 2013: 12-13).

As planned by the responsibility sharing of the cluster approach, specific actors were in charge of specific sectors, according to their mandate, competences and field presence. The DSWD and the United Nations Development Program (UNDP) took the lead for the early recovery cluster (OCHA, 2013: 53). Cluster outputs included the distribution of food packs and the realization of cash-for-work such as hiring workers to clear debris, rebuilding homes and infrastructure (OCHA 2013: 13). Bunkhouses were constructed and emergency shelter kits were distributed to address the needs for shelter (OCHA, 2013).

However, significant gaps remained in the provision of shelter (OCHA 2013: 13, OCHA 2013d). A comprehensive shelter policy for Bopha had still to be drafted in March 2013 (Scheidler & Hilmi, 2013). This lack of policy hampered humanitarian assistance because local authorities, communities and other humanitarian stakeholders were awaiting clarity in how to address certain shelter issues. However, a comprehensive shelter policy could have significantly accelerated the provision of assistance to those living in evacuations centers, transitional sites, spontaneous settlements and in other vulnerable conditions (Scheidler & Hilmi, 2013). This had been seen in the previous year when Typhoon Washi hit the country. In its aftermath, a Local Inter-Agency Committee (LIAC) had been created that developed a shelter strategy to coordinate and leverage national and international assistance more effectively (Scheidler & Hilmi, 2013),

The environmental disasters that happened in the months after Bopha added to the challenge of implementing the clusters approach and addressing the needs of the displaced population. In particular, rains did not stop for months and dangerous floods occurred in Bopha-affected regions in January 2013 (IRIN, 2013). The monsoon and typhoon season that started in May/June were additional challenges (Scheidler & Hilmi, 2013).

The inaccessibility of areas, politicization of aid and security have also been major challenges to adequate and nondiscriminatory aid provision. Many areas were hardly accessible and sometimes only accessible with helicopters due to the destruction of numerous roads and bridges.[10] Additionally, local groups and typhoon survivors argued that the provision of aid would have been politicized due to the elections in May 2013. This would have meant that those who were considered potential voters would have been provided with humanitarian assistance before others that were not considered potential

9. Ibid.

10. Interview with IOM Regional Emergency and Post Crisis Specialist.

voters (IRIN, 2013a). Furthermore, humanitarian assistance had to take special security measures due to the conflict-related situation in the region.[11]

Funding has been a last major challenge to humanitarian response efficiency. Even though constant appeals were made to the international community, the humanitarian response to Bopha has generally been underfunded, especially for emergency shelter needs (OCHA, 2013d). Out of the nearly one hundred thousand people who were helped by agencies in the shelter cluster, for example, only half had obtained a tarpaulin because of the agencies' inability to obtain the sufficient financial resources (Bamforth, 2013).

5.4. No-Build-Zones (NBZs)

Besides the clusters approach that has particularly focused on addressing the needs of the displaced population in the short-term, the Government has implemented actions that aim to reduce the risk of people's displacement due to natural disasters in the long-term. A particularly interesting and controversial strategy has been the identification of so-called 'No-Build-Zones' (NBZs). To do so, the Government's Mines and Geosciences Bureau (MGB) has conducted geo-hazard risk assessments in Bopha-affected provinces. In these assessments, areas are classified either as low-risk areas where it is safe to build, medium-risk areas where mitigation measures may be appropriate or high-risk areas where it is unsafe to build. High-risk areas are interpreted as NBZs. Depending on the risk category, the MGB recommends actions that can be either moderate or radical. For example, in some cases, it is recommended to move houses for a few meters away. In other cases, it is recommended to relocate whole communities. (IRIN, 2013; Kelly, 2013: 17)

Until today, the Government has not yet released a NBZ policy. The MGB recommendations are not compulsory and cannot be legally enforced on local governments (Kelly, 2013: 16-20). Nevertheless, the identification of NBZs has had important consequences. For example, President Aquino has urgently advised local governments to adopt the recommendations issued by the MGB (Kelly, 2013: 17). In addition, several national authorities have avoided providing rebuilding assistance to areas that were classified as NBZs (Kelly, 2013: 18). Furthermore, in order to realize resettlement programs, local governments have to obtain an authorization from the MGB to ensure that these areas are safe (Kelly, 2013: 18). If areas have previously been classified as a NBZ, authorization forms are not issued.

A major reason why the demarcation of NBZs is still an unofficial policy is that it is a highly controversial topic. This has been discussed at numerous levels within the Philippines for many years and Bopha has, all over again, clarified the contentious nature of this topic.[12] On the one hand, the realization of NBZs could significantly lessen Mindanao's risk of people displacements because of natural disasters. On the other hand, important challenges to implement such policy exist.

For example, challenges can be associated with indigenous people. Many indigenous communities live in areas that are likely to be classified as NBZs. However, they may be reluctant to move from their land due to their ancestral relationship with the land (Kelly, 2013: 26-28). In addition, their land and property rights are legally recognized by the Indigenous People's Rights Act (IPRA) of 1997, complicating issues around relocating them (Kelly, 2013: 26-28). Indeed, Section 7 of the IPRA that shows that indigenous people are only entitled to return to their land if the State considers it to be "safe". However, many indigenous people are likely to not accept this clause if it is to be enforced. Numerous field consultations conducted after Bopha revealed that indigenous people have an extremely strong desire to return to their land. Although indigenous people went through trauma, experienced severe losses and are aware that such disasters can happen again, they still want to go back to their old homes and regions that their ancestors have inhabited for centuries.[13]

People's reliance on certain livelihoods and their willingness to change particular life patterns can also complicate the creation of NBZs. Given that many people rely on subsistence and commercial farming, their relocation to land unsuitable for such activities can be devastating (Scheidler & Hilmi, 2013). Furthermore, several people have expressed their unwillingness to transform their life styles because as migrating would require them to do so (Kelly, 2013: 22). For example, people who have a long family tradition of farming may now have to be a fisher due to the new living circumstances.[14]

11. Interview with IOM Communications Specialist. The rural-based guerrilla force, New People's Army (NPA), which is the military wing of the Communist Party of the Philippines (CPP), has been fighting in eastern Mindanao against the Philippine government for decades (OCHA, 2013: 9; BBC, 2012).

12. Interview with IOM Communications Specialists, Interview with IOM Regional Emergency and Post Crisis Specialist.

13. Interview with IOM Communications Specialist.

14. Ibid.

Furthermore, there are important logistical and cost challenges. In some instances, the MGB has identified many and wide-ranging areas as NBZs. For example, 80 per cent of New Bataan has been classified as such.[15] Clearly, this raises questions around whether the relocation of a great number of people is feasible to implement and if there is a viable alternative to which they could be relocated.[16] Another challenge is that the relocation of people is often a slow process. In particular, the identification of relocation sites has seen significant delays. While government land has been acquired relatively fast, negotiating relocation sites that are privately owned has taken far longer (Kelly, 2013: 21-22). In addition, past experiences have shown that the relocation of people has been a very costly policy (Scheidler & Hilmi, 2013). Given that the Philippines are ranked as lower-middle income country, associated costs can be a difficulty to finance (World Bank, 2013).

Finally, political issues can represent obstacles to put a NBZ policy into practice. Although the national government is generally in favor of implementing NBZs, local governments do not often agree with the realization of NBZs, mainly because this would complicate the usual voting procedure.[17] In particular, population shifts may mean that certain voting districts will cease to exist. As a consequence, the existence of local governments in these areas may be affected.

6. CONCLUSION AND POLICY RECOMMENDATIONS

This study has shown the extent to which the Bopha typhoon has caused large-scale displacements of people. These displacements have been complex because they occurred before and after the typhoon in many different forms. Furthermore, the typhoon has decreased standards of living of the displaced people both in the short and long term. The economic status of the Philippines may drag out the negative impacts of the storm because of the country's financial limitations. This already difficult situation is additionally complicated because climate patterns are changing and similar disasters may increasingly happen in the future in the country.

The above-explained situation has confronted the Philippine government with new challenges that are related to the issue of the displacement of people due to natural disasters. Indeed, many have considered the country as a global leader in enacting policies and legislation to reduce the risk of natural disasters. However, given the detrimental impacts that Bopha had, more efforts need to be taken to address the issue of natural disasters and its consequences on the displacement of people more effectively.

Policy recommendations are suggested to address how to more efficiently prepare and manage forthcoming disasters, and address the particular needs of those displaced.

Scale up current policy responses

The humanitarian assistance should scale up the current policy responses. Still today, there are many gaps that need to be filled in order to address the needs of the displaced people in a more effective and efficient manner. The implementation of a comprehensive shelter policy should be considered as a priority. Furthermore, it should include increasing the financial support for the different clusters, especially for the shelter cluster that has experienced insufficient funding (OCHA, 2013c).

Implement standardized preparedness measures

Standardized preparedness measures should be implemented countrywide. In an interview, specialists on post crises and emergency issues noted that the Philippines were prepared for a typhoon of such great strength; however, it was not prepared for a typhoon that hit the country so far in the south in such enormous power. To implement such measures, offices that exclusively handle issues related to natural disasters could be established in each province; governmental actors from the regional, municipal and village level should participate in regular and compulsory trainings; and national campaigns that inform the population on appropriate preparation measures and emphasize that early warning systems must be taken seriously should be conducted in all provinces. The case of Indonesia could serve as an example of how a best practice approach could be implemented, given that this country has realized a standardized way of response. [18]

Develop clear strategies that address the needs of those who live in so-called 'NBZs'

It is recommended to develop clear strategies that address the needs of those who live in areas that are to be classified as NBZs, which still appears to be a grey area in existing policy responses.

15. Ibid.

16. Ibid.

17. Interview with IOM Regional Emergency and Post Crisis Specialist.

18. Ibid.

Strategies should include developing clearer legal instruments that describe the process of declaring and enforcing NBZs (Kelly, 2013: 20). Furthermore, people living in NBZs should be clearly informed about the risks they face and receive appropriate assistance that support their decision – whether it is to remain in the NBZ area or move away (Kelly, 2013:20).

Ensure that mechanisms to protect the rights of people displaced by environmental events are put into action

It is imperative to ensure that appropriate mechanisms to protect the rights of people displaced by environmental events are put into action. People displaced by natural events do not only have particular needs, but their numbers may also be increasing in the coming years due to the changing climate patterns affecting the Philippines. Indeed, in February 2013, the Philippines's Congress took already the right step in the right direction by launching a landmark bill that spells out the particular rights of IDPs before and after displacement and allows IDPs to claim monetary assistance and compensation (UNHCR, 2013). The challenge is now one of its implementation. [19]

19. National and international actors praised this bill, which represented the first of its kind in Asia, as a milestone for the protection of IDPs in the Philippines (UNHCR 2013). However, in June 2013, the President of the Philippines vetoed the Rights of the IDP Act (NRC&IDMC 2013). Clearly, this emphasizes both the challenge to implement mechanisms to protect the rights of people displaced by environmental events, as well as the need to continue campaigning for it.

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IN FOCUS

Cyclones Giovanna and Irina make thousands of people homeless

Maëlle Robert

Each year, an average of three to four strong tropical storms formed in the Indian Ocean hit Madagascar. In the night from 13 to 14 February 2012, Cyclone Giovanna landed on the eastern coast of the island, moved inland and crossed the country from the east to the south-west, bringing strong winds, high waves, heavy rains and flooding. The eastern districts were the most affected. Two weeks later, on the 26 of February, another tropical storm, Irina, hit the island. The two disasters caused 112 deaths, injured 299 people and left three people presumed lost[1]. According to the National Office of Risk and Disaster Management (BNGRC), an estimated 60,000 houses, in addition to schools, health centres and vital infrastructure, were destroyed, damaged or flooded[2]. The BNGRC, supported by non-governmental organizations (NGOs), quickly organized humanitarian assistance to provide people drinking water, food stoves and/or sanitation products. Efforts were also made to rebuild the damaged infrastructure (roads, bridges, telecommunication installations, schools, houses).

Temporary migration: how far, how long?

Overall, the two storms displaced about 55,000 people,[3] mostly temporarily and close to their homes. Most of them chose to move just before the cyclone: they took shelter in neighbors' solid houses or evacuated to more resistant structures, such as schools or churches[4].Their return usually occurred after a couple of days, and they often rebuilt their huts at the same place as before. Yet, as Giovanna and Irina mainly hit isolated and landlocked villages, where many people did not receive the alert messages broadcasted on the radio stations or the warning campaign, a majority of the people did not evacuate.

In the following months, because Giovanna and Irina flooded private food reserves and destroyed more than half of the crops, food prices rose in several places. It is doubtful however that this growing food insecurity induced further migration across the region[5].

Long-term challenges - Reducing Vulnerabilities

Madagascar's current political crisis has complicated the national response to natural disasters. Since 2009 and the deposition of the elected President Marc Ravlomanana by President Andry Rajoelina deposed, great troubles have shacked the country. Today, emergency assistance is mainly provided by international institutions or NGOs and Malagasy rulers have become dependent on foreign donors to finance any action. After Giovanna and Irina, most of the outside funding has been used for rebuilding, rather than disaster risk reduction. Yet, risk could be minimized.

The government has to invest to *improve the early warning system* by using new telecommunication means – especially phone messages. This system is efficient; however, it is difficult to apply in the rural areas, where people don't necessarily have mobile phones and a functioning network.

As traditional huts are mainly composed of wood, reeds, bamboo and palm leaves that hardly withstand storms, community leaders should encourage people to build durable structures with baked stones or concrete. Currently, they are also trying out *new ways of constructing,* particularly using crossing houses frame, an anti-storm architectural style inspired by the anti-earthquake Japanese constructions, in order to make the buildings more flexible and resistant to shocks and strong winds[6].

Local leaders need to develop collective food reserves, raised or sheltered in safe places, in order to prevent them from being flooded and to ensure food security notwithstanding environmental disruptions.

As a global issue, the national government has to keep on *fighting deforestation* to make trees serve as buffers to slow winds and prevent floods by increasing soil's absorption capacity[7].

In any case, it is essential to include the people, so that they behave in a way that best reduces their vulnerability[8].

1. Data from the National Office of Risk and Disaster Management (BNGRC) – From an email interview with Katia Rakotobe from CARE Madagascar, in mission in Antananarivo, 16 - 17 April, 2013.
2. National Office of Risk and Disaster Management (BNGRC), Executive Secretariat and Malagasy Home Office : "Bilan provisoire des dégâts suite au passage du cyclone tropical intense "Giovanna"", 14 March 2012, http://www.bngrc.mg/documents/giovanna/SITU%20Giovanna%2014_03-15h.pdf
3. Data from the National Office of Risk and Disaster Management (BNGRC) – From an email interview with Katia Rakotobe from CARE Madagascar, in mission in Antananarivo, 16 - 17 April, 2013.
4. Email interview with Thierry Razanakoto, National Consultant and Research Assistant, IOM (Madagascar), 17 - 18 April, 2013.
5. Interview with Emmanuel Lan Chun Yang, Responsible for emergency actions in CARE France and Responsible for an assessment on the CARE projects in Madagascar after the passage on Giovanna on site, 16 April, 2013.
6. Interview with Emmanuel Lan Chun Yang, Responsible for emergency actions in CARE France and Responsible for an assessment on the CARE projects in Madagascar after the passage on Giovanna on site, 16 April, 2013.
7. Interview with Emmanuel Lan Chun Yang, Responsible for emergency actions in CARE France and Responsible for an assessment on the CARE projects in Madagascar after the passage on Giovanna on site, 16 April, 2013.
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CYCLONE EVAN IN SAMOA

ANNE MELDAU

INTRODUCTION: NATURAL HAZARD AND DISASTER EVAN

In December 2012, a tropical depression formed in the South Pacific, which was subsequently named Tropical Cyclone Evan and eventually developed into a Category 4 tropical cyclone. In its path, Evan brought heavy winds and rain to the island nations of Tonga, Fiji, Samoa and the French territory of Wallis and Futuna. This case study will present an analysis of the cyclone's impacts on Samoa with a particular focus on migratory effects including evacuations, shelter, reconstruction and possible relocation in the Small Island Developing States (SIDS).

Pacific SIDS, such as Samoa, are often portrayed as the first victims of climate change in international negotiations, especially in the context of sea-level rise. Apart from this, they rarely make news headlines in Europe or the United States of America in case of a disaster. This is arguably due to their isolation and small size, particularly with respect to their populations. Yet, the size of Samoa's population – 187,820 (OCHA, 2012b) – should not impede their inclusion in analyses of natural disasters and related migration. The South Pacific is one of the most natural-disaster-prone regions of the planet and therefore a "hotspot" of climate change not only with respect to rising sea levels. For Samoa, sea-level rise, coastal erosion and climate change are mentioned, among others, as key issues related to the country's natural environment in the National Disaster Management Plan (National Disaster Council, 2011:16). Additionally, Samoa's exposure to natural hazards is highlighted, including ever-present threats such as volcanic eruptions, earthquakes and tsunamis as well as seasonal threats such as droughts, floods and tropical cyclones (ibid.:17). The following table shows the "extreme"- and "high"-risk hazards identified in a risk assessment for Samoa. Levels of risk were based on the likelihood of a disaster caused by a hazard and the consequences of the hazard.

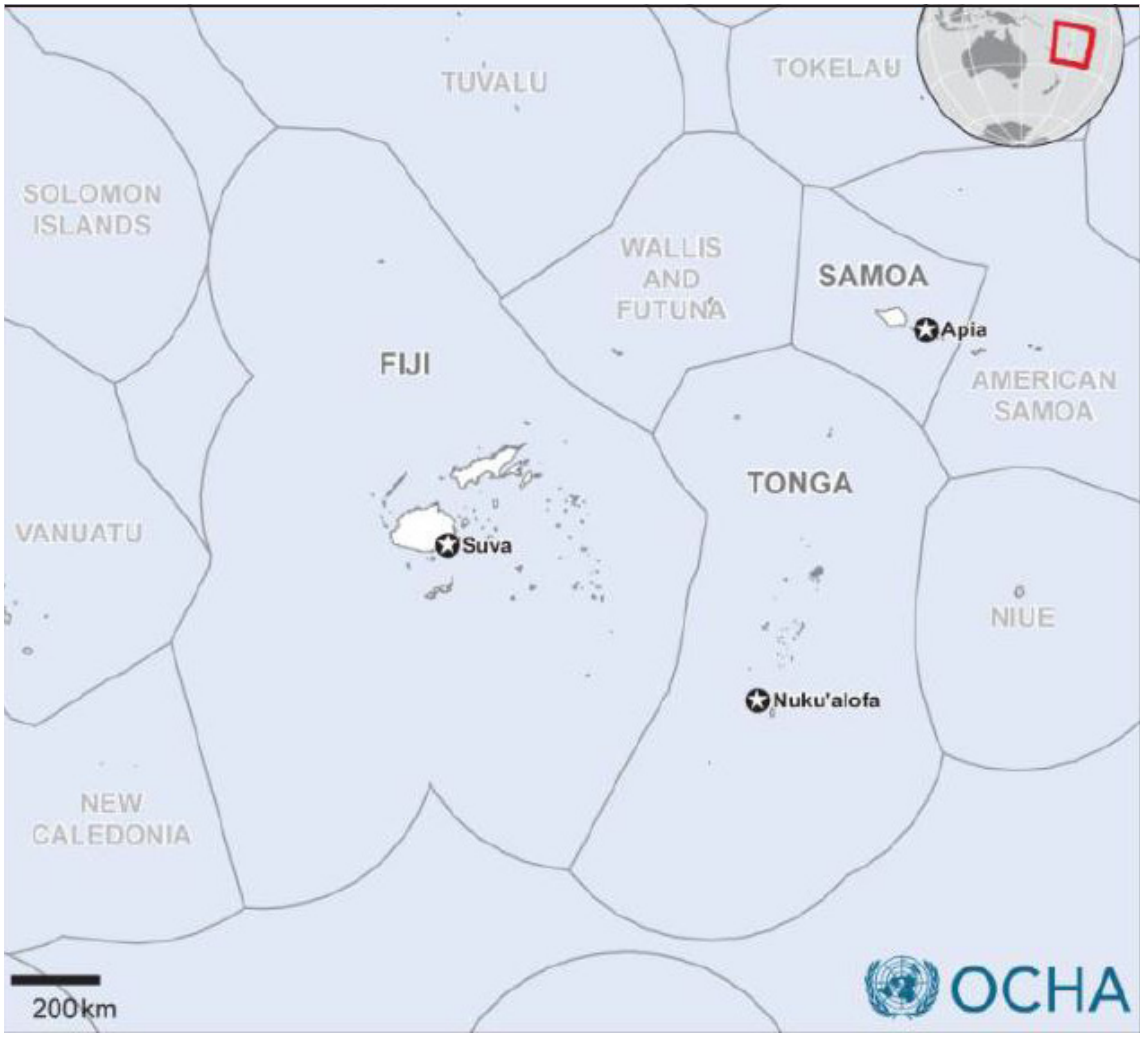
Table 1. Highest risk hazards for Samoa

Risk Level	Type of Hazard
Extreme	Cyclone (inluding stormsurge)
Extreme	Volcanic Eruption
Extreme	Tsunami
Extreme	Apia: Urban Fire
Extreme	Public Health Crisis
Extreme	Environmental Crisis: Invasive Species
High	(Inland) Flooding (due to heavy rain)
High	Earthquake
High	Landslide
High	Forest Fires
High	Airport: Aircraft Emergency
High	Hazchem Incident: Marine

Source: based on "Table 1: Highest risk hazards for Samoa" (National Disaster Council 2011:18)

Tropical Cyclone Evan is a typical example of a natural hazard that has turned into a disaster. It will be analysed as such in this case study. First, the essential facts on Cyclone Evan and its impact on Samoa will be presented. The section will include a description of the storm, information on its economic effects and initial disaster response and management as well as insights into the context of natural disasters in Samoa and the country's vulnerability to them. Second, the migratory effects of the cyclone will be addressed including evacuation and return of the affected population, rebuilding and relocation. Finally, a conclusion will, finally, summarize the findings and put them into their broader context, the state of environmental migration in 2012.

Map 1. Map of Islands Affected by Evan



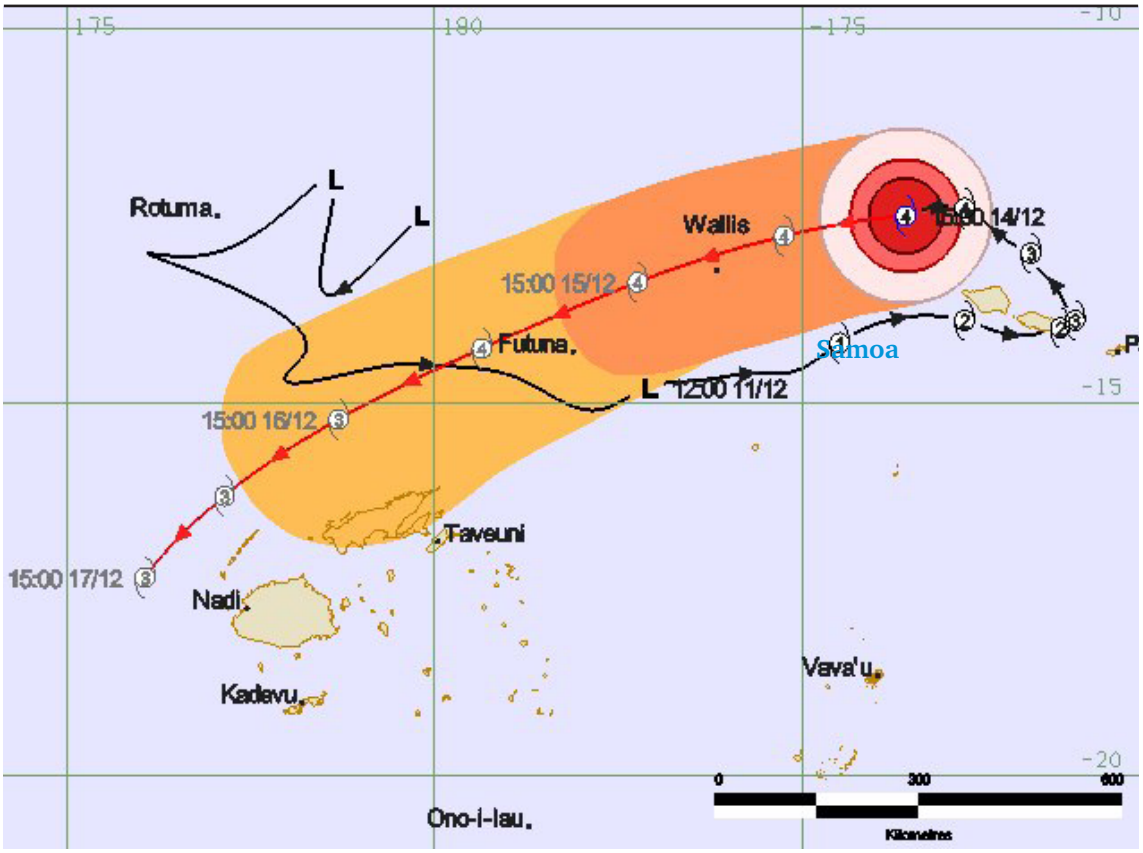
Source: OCHA 2012b

1. A STORMY AFFAIR: EVAN'S MARK ON SAMOA

1.1. Natural hazard Evan: wind, rain and floods

On 9 December, a weak tropical depression was noticed about 700 km northeast of Suva, Fiji (Government of Samoa, 2013:4). At 8 a.m. (Samoan time) on 12 December 2012, the US Joint Typhoon Warning Centre issued a tropical cyclone advisory. Around 5 p.m. the Tropical Depression 04F was upgraded to a Category 1 tropical cyclone and named Evan by the Regional Specialized Meteorological Centre, RSMC (Budvietas, 2012; Fiji Meteorological Service, 2012a). Evan intensified and was upgraded by the RSMC to a Category 2 storm at 2 a.m. on 13 December (Budvietas, 2012). That night, the Samoa Meteorological Services issued a special weather bulletin including a storm warning, hurricane watch and flood advisory (Samoa Meteorological Services, 2012; Radio New Zealand, 2012). Evan was stationary over the country for about 24 hours, where it intensified into a Category 3 tropical cyclone; the RSMC upgraded it at 8 p.m. on 13 December (OCHA, 2012a; Budvietas, 2012). The main damage was done during the late afternoon of 13 December in a two-hour period from 4 p.m. to 6 p.m. (ABC Radio Australia, 2013a). Of the two main islands of the country, Upolu and Savai'i, the former was particularly affected with significant damages particularly on the south coast and in the capital Apia (OCHA, 2012a, 2012b). After leaving Samoa, Evan continued towards Fiji, transforming into a Category 4 tropical cyclone (OCHA, 2012d). At its peak, Evan reached wind speeds of 185 km/h according to the US Joint Typhoon Warning Centre (Budvietas, 2012).

Map 2. Tropical Cyclone Evan Forecast Track Map



Source: Fiji Meteorological Service, 2012b

In Samoa Evan brought winds of up to 110 km/h and a total rainfall between 9 a.m. on 13 December and 9 a.m. on 14 December that amounted to 413 mm in Afiamalu and 207 mm in Nafanua, both on Upolu Island (OCHA, 2012a). Apart from the capital, the rural areas of western Upolu and the south-coast villages Siumu, Safata and Lefaga were most severely affected (Government of Samoa, 2013:40). Flooding of the banks of the Vaisigano River caused by the cyclone also led to major damages (ONE News, 2013a). For example the floods of the river, which runs into Apia, completely destroyed the village of Magiagi with water rising up to five metres high (ONE News, 2012) and led to severe flash floods in the capital (OCHA, 2012a).

1.2. Natural disaster Evan: destruction, damages and loss of human lives

A total of five people were killed by Cyclone Evan in Samoa (Government of Samoa, 2013:5) including two children (Budvietas, 2012) and it has been pointed out that this number stayed comparably low because the storm hit during daytime (ABC Radio Australia, 2013a). The search for 10 missing persons was called off in mid-January (Press Secretariat Government of Samoa, 2013a). These included fishermen lost at sea (OCHA, 2012c; Budvietas, 2012).

In the immediate aftermath of the cyclone, the whole of Samoa was without electricity and running water (OCHA, 2012a). There was substantial damage to three hydropower plants, minor damage to two others (Government of Samoa, 2013:81) and a significant amount of debris-restricted access to affected areas (OCHA, 2012g).

There was severe damage to infrastructure, including roads and buildings, and many trees were downed (Budvietas, 2012; Government of Samoa, 2013:5). To illustrate this, the Post Disaster Needs Assessment (PDNA) states that "the estimated value of destroyed physical assets represents 109 per cent of the normal value of construction activities in Samoa" (Government of Samoa, 2013:xiii).

The tourism industry stated that damage was worse than after the 2009 tsunami (OCHA, 2012e) and amounted to USD 12.1 million.

Additionally, revenue losses are projected to sum up to USD 9.5 million for the time period from 2013 to 2015 (Government of Samoa, 2013:33f). For the agriculture and fisheries sector damage

and loss are estimated at about USD 32.8 million (ibid.:21). The worst hit areas suffered losses of up to 100 per cent of banana trees, 50 per cent of breadfruit, 80 per cent of other economically important crops such as cocoa, citrus and coffee as well as 30 per cent of root crops (Press Secretariat Government of Samoa, 2012). These losses were concentrated on Upolu Island, where the worst-hit areas were the south-western, central and southern parts and the central highlands (OCHA, 2013c; Government of Samoa, 2013:18). On the contrary, Savai'i Island was hardly touched and could provide food supplies to the rest of the country (ABC Radio Australia, 2013a). However, many families lost their private gardens, which are used for personal consumption, as well as parts of their root crop productions, used for subsistence and selling (European Commission, 2013). About 7,000 households, equivalent approximately to 30,000 people, were affected and many small farmers are expected to lose around half of their 2013 annual income (Samoa Observer, 2013a). Consequently, people with low incomes and subsistence farmers were most adversely impacted by the cyclone (Government of Samoa, 2013:xiv ff.).

The total economic effects of the cyclone were also substantial. Initial estimates of total damages were made at more than USD 200 million (ABC Radio Australia, 2013b; Samoa Observer, 2013a) and the PDNA set the total effects to USD 203.9 million (Government of Samoa, 2013:xiii). For a country with a GDP of approximately USD 1.128 billion (CIA, 2013), this represents a substantial sum amounting to 18.1% of GDP. The public sector incurred 55 per cent of the disaster effects and a total loss of about 9,600 equivalent jobs was estimated (Government of Samoa, 2013:xivff). As a consequence of production losses and increased expenditures, GDP forecasts for the next years were lowered. Growth might be zero or negative for 2013 and might not fully recover in 2014 (ibid.:101).

1.3. Initial disaster response and subsequent disaster management

A declaration of disaster was issued on the national radio around 2 p.m. on 13 December by the deputy prime minister who was also the acting chairman of the National Disaster Council (Tusani, 2012). When it expired after 48 hours it was renewed until midday on 17 December (OCHA, 2012b). That day, a state of emergency was declared for 30 days (OCHA, 2012c). Parliament reconvened on 18 December (Samoa Observer, 2012).

In the morning of 13 December the National Emergency Operations Centre was activated to coordinate the emergency response (OCHA, 2012a). It included four sub-committees: First Response, Community Welfare and Internal Displaced Persons, Housing Reconstruction and Settlement, Early Recovery and Recovery Needs Assessment (Press Secretariat Government of Samoa, 2012).

Restoration of the water and power supply as well as providing support for the shelters were identified as the most critical humanitarian priorities (OCHA, 2012g). Debris was cleared by 12 January and water supply restored up to 90 per cent by 15 January (Press Secretariat Government of Samoa, 2013a). The Electric Power Corporation had restored 80% of electricity on Upolu Island by 6 January (Press Secretariat Government of Samoa 2013b). With respect to the emergency centres, the situation in Apia was reported as good with less information on those shelters located in rural areas (OCHA, 2012f). Issues raised regarding the shelters were mainly the supply of drinking water and sanitation (OCHA, 2012b), food (OCHA, 2012d) and later on also safety due to a lack of police presence (OCHA, 2012e). The government provided water, food and non-food items (Press Secretariat Government of Samoa, 2012) and installed pit latrines (Press Secretariat Government of Samoa, 2013a). One issue reported in the PDNA was that shelters were prioritized for distribution of relief items, which was particularly problematic as people were not aware of this prioritization (Government of Samoa, 2013:111).

In addition to provisions from the government and local religious and humanitarian organizations, international assistance was important. Foreign governmental help was received from New Zealand, Japan, Australia, the United States, American Samoa and the EU. International organizations including UNDP, WHO, OCHA, UNESCO, the Asian Development Bank and the World Bank also provided assistance (OCHA, 2012b, 2012d, 2012g; European Commission, 2013; ADB, 2012; Samoa Observer, 2013a). International help mostly encompassed shelter, sanitation, tools as well as technical expertise (Press Secretariat Government of Samoa, 2012).

Damage assessments commenced directly after the storm. Initial ground assessments were completed for Upolu Island on 17 December and indicated considerable damage while reports from Savai'i Island suggested that damage was minimal there (Budvietas, 2012). The Post Disaster Needs Assessment and Damage and Loss Assessment mission took place from 7 to 20 January with the infrastructure and shelter parts starting on 3 January (OCHA, 2013a). For the first time ever UNESCO additionally undertook an assessment of the

impacts on the cultural sector, especially concerning cultural heritage, which were moderate with the exception of some landmarks suffering severe damage (UNESCO Apia, 2013).

1.4. Putting the storm into context: Evan and other natural hazards in Samoa

Samoa is located in Polynesia in the South Pacific. This region is one of the most vulnerable places in the world to natural disasters with up to today millions of people affected by them and billions of dollars of economic losses (Bettencourt et al., 2006:viii; The International Bank for Reconstruction and Development and The World Bank, 2010:30). Pacific nations figure prominently among the world's countries with the highest annual losses from disasters as a proportion of GDP (The World Bank, 2013). For Samoa, the average annual impact on GDP in disaster years (for the period from 1950 to 2004) was 45.6 per cent with 6.6 per cent average impact in all years (Bettencourt et al. 2006: 2) and the country is expected to suffer USD 10 million/year in losses caused by earthquakes and cyclones (SPC/SOPAC et al., 2011:1). In the region, cyclones are the most common type of disaster and climate change is intensifying the situation. Over the past 50 years, the overall number of hurricane-strength cyclones has increased in the region. Today, an average of four of these cyclones occurs in the south-west Pacific every year. Additionally, the intensity of cyclones increases. Wave heights, for example, have exceeded the predictions made in climate change models (Bettencourt et al., 2006:1).

These observations also apply to Samoa, which lies in the South Pacific tropical cyclone belt (Sutherland et al., 2005:13) and whose tropical cyclone risk is classified as "extreme" (National Disaster Council, 2006:6). The 2012/2013 official cyclone season was 01 November 2012 to 30 April 2013 with mid-February to mid-March historically being the period with most tropical cyclones in the South Pacific; between 9 and 11 named cyclones were forecast (OCHA, 2013d). Therefore, experiencing a damaging storm as early as December means that the affected areas face the risk of being hit again and enduring severe damage in the following months. With respect to Evan, an ensuing tropical depression brought more rain, wind and flooding to Apia in mid-January (Tupufia, 2013a).

If Samoa have experienced various natural disasters including storms, Evan has caused devastation that had not been seen since Cyclone Val in 1991 (Budvietas, 2012; Government of Samoa, 2013:4).

In regard to other disasters, the 2009 tsunami destroyed 20 villages, killed 143 people, displaced 3,500 and caused damage of approximately USD 147 million (Fickling, 2012). Therefore, though less deadly, the economic damage of Evan is probably at least as severe. A staff member of the International Monetary Fund put the two into relation: "The disaster caused a significant disruption to economic activity, which had just recovered following the devastating effects of the 2009 earthquake and tsunami" (IMF, 2013). It is in the context of recurring disasters that policy responses to Evan need to be evaluated.

2. EVAN AND ENVIRONMENTAL MIGRATION

2.1. The difficulty of keeping track: evacuation and damage to houses

As a consequence of damages and destruction caused by high winds and the flooding of the Vaisigano River banks, about 6,000 people were evacuated (Government of Samoa, 2013:7). Giving concrete estimates of the people subsequently staying in evacuation centres is difficult due to a number of reasons.

First, people went to official evacuation centres in rural areas and in Apia but also turned to informal centres, which were often managed by denominational groups (OCHA, 2012b). This is explained as Samoans have strong religious ties and Church plays a crucial role in everyday life (National Disaster Council, 2011:16). Second, some families went to stay with relatives or neighbours instead of turning to an evacuation centre (Press Secretariat Government of Samoa, 2012). This was encouraged by the National Emergency Operations Centre, which requested people in rural communities to accommodate evacuees (OCHA, 2012a). Third, while numbers seemed to be decreasing in the days immediately after the storm as people returned home (OCHA, 2012b), they started to increase again at the end of December. Apparently, some "families that initially evacuated to family/friends […] decided that their needs are better met at the centres (timely food and supplies which the distribution evacuation centres have prioritised)" (Press Secretariat Government of Samoa, 2012). These three reasons make that different numbers were given by the government and international organizations such as the UN Office for the Coordination of Humanitarian Affairs (OCHA). The following diagram displays the statistics provided by the latter.

According to OCHA, the number of people in evacuation centres/shelters (see Side Note: Terminology for a discussion of terms) therefore equalled 4.1 per cent of the total population of Samoa (187,820) at its peak (OCHA, 2012b).

The actual number can be considered to be higher as neither all informally-run centres nor those people seeking shelter with relatives or friends are included in these official counts. Furthermore, the figures should, by no means, be seen as definite and complete; additional information and competing numbers for the same dates are also available. For example, Caritas Australia (2012) indicates 1,000+ evacuees staying at the basement hall of the Caritas Samoa office on 16 December. For 28 December, the ADB (2012) states 4,000+ people evacuated. Therefore, all figures should be seen as incomplete estimates. They can nevertheless give an indication of the number of people that evacuated to various formal or informal places. Additionally, the differing numbers illustrate the challenge of keeping track with a sometimes rapidly evolving natural disaster situation, especially if people resort to informal solutions, such as help from family and if needs differ largely. This was for example the case with respect to the period people spent at the shelters. While some stayed only one night or a couple of days, others remained at the shelters for the entire period they were open (Government of Samoa, 2013:109).

The main evacuation centres were managed by the Samoa Red Cross Society, the Disaster Advisory Committee, local government, Caritas, Church Jesus Christ of Latter-day Saints and Seventh Day Adventist churches, to give some examples (Press Secretariat Government of Samoa 2012). This means that three main groups of actors were involved, the Samoan Government (local and national level), humanitarian organizations and churches. After Cyclone Evan was the first time there were officially designated emergency centres. These official shelters were located in urban areas while people in rural communities sheltered in make-shift refuges such as church halls or with other families (Government of Samoa, 2013:109).

The strong winds and floods brought by Evan affected a total of 2,088 houses including 253 that were completely destroyed (Government of Samoa 2013:54ff.). This number was reduced from originally almost 700 houses reported as destroyed (Press Secretariat Government of Samoa 2012), apparently because some people had put in multiple claims under different names or for outdoor toilets (ONE News, 2013b). As was the case for evacuee numbers, this indicates the difficulty of keeping track of disaster effects, which is essential for targeted disaster management and the coordination of relief efforts.

In addition to the destroyed houses, 353 were partially damaged and therefore unsafe so that a total of 606 houses were left in need for reconstruction. The remaining 1,482 affected houses suffered minor damages. The overall damage and loss including household goods is estimated at USD 19 million. Most of the damages occurred on more populous Upolu Island in Vaimauga West (north); followed by Safata, Siumu (both south); Falealili, Lefaga ma Faleseela (both south); Anoamaa West and Vaa o Fonoti (both north-east) (Government of Samoa, 2013:54ff.).

Thus, following the cyclone an estimated 4,242 people (based on average household size of seven members) were in immediate need of financial and technical assistance with reconstruction (ibid.:xvii). Applying this average household size to the total number of house damages, an estimated total of 14,616 people were affected, which represents about 7.8 per cent of the total population.

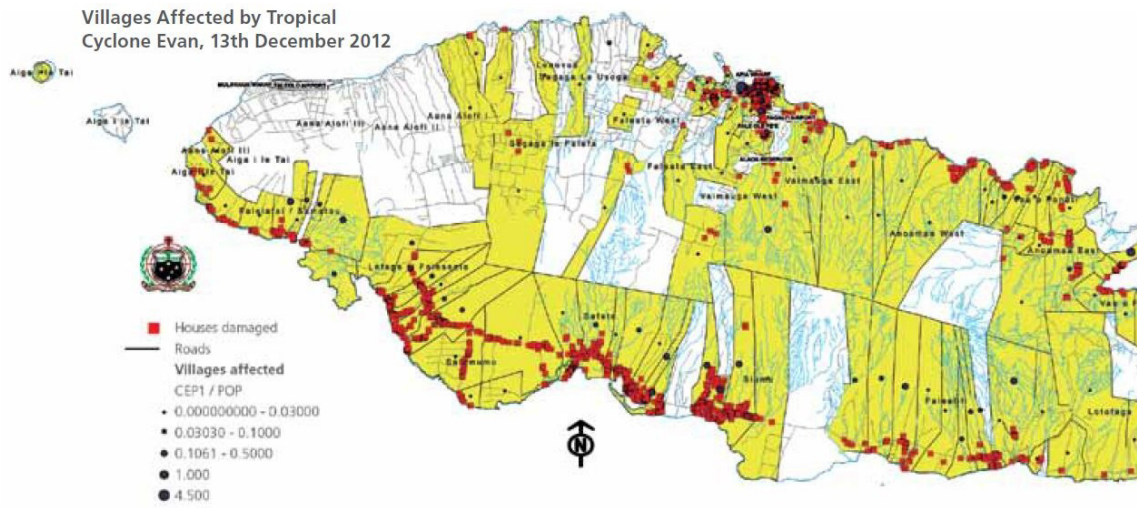
2.2. An official return of the affected population

Returning home to rebuild was encouraged by the government already few days after the storm (OCHA, 2012d, 2012g). The formal evacuation centres were closed at noon on 5 January, based on a decision by the National Disaster Council on 31 December, partly to prepare school buildings used as shelters for the beginning of the school year at the end of the month (Press Secretariat Government of Samoa, 2013b). However, as some people had nowhere to go because their houses had been destroyed, it took in practice a couple of weeks until everybody had left.[1] By March most of the temporarily displaced had returned and lived in temporary homes constructed of tarpaulins, plastic sheeting, and timber. Some people still lived with relatives or friends in overcrowded housing units (Government of Samoa, 2013:54).

Thus, the closing of the official evacuation centres should not be interpreted as a change back to normal. The tropical cyclone season was on-going making living conditions in temporary housing difficult and the returned population vulnerable to new rains and flooding.

1. Interview with Dr Sue Vize, Officer-in-Charge, UNESCO Apia, conducted on 11 March 2013 via email.

Map 3. Villages Affected by Cyclone Evan on Upolu Island



Source: Government of Samoa, 2013:12

2.3. Recovery in Samoa: reconstruction and relocation

Disaster response includes recovery, but can also be used to prepare for future developments such as the recurrence of natural disasters through risk reduction measures. For cyclone-prone Samoa, not only reconstruction is an issue, but relocation may become an adaptation strategy to environmental stressors as well.

Reconstruction constrained: financial challenges for an effective recovery of the most vulnerable households

The PDNA estimates the total amount of money needed for recovery and reconstruction in the housing sector alone at about USD 21.9 million and reconstruction to take two years. With respect to how reconstruction should go about, the PDNA recommends monitoring to ensure pre-disaster vulnerabilities are not recreated (Government of Samoa, 2013:54). For infrastructure some proposals include digging electricity poles deeper into the ground (ABC Radio Australia, 2013a), changing the alignments of water pipes that typically follow river flows, use below-ground pipework and create upstream flood protection (Government of Samoa, 2013:79). With respect to trees both cutting those close to homes, electricity lines (ABC Radio Australia, 2013a) and fences holding livestock (Government of Samoa, 2013:26) as well as replanting them selected locations were proposed. The latter is due to the fact that deforestation near rivers and streams increased the impact of flash floods (Samoa Observer, 2012). Suggestions also included homes elevations to protect from flooding (ibid.:132). Medium-term requirements for the building sector proposed in the PDNA also included an update of the building code (and ensuring it is correctly implemented), retrofitting and an increase in home-insurance coverage. During Evan it also became apparent that traditional Samoan houses were less damaged than European-style ones, something that was encouraged to be considered when rebuilding (ibid.:61f.).

Following the disaster, the Prime Minister stated that government has "been asking people to help themselves rebuild their homes" (ABC Radio Australia, 2013a). Similarly, the PDNA accords only a catalyzer and facilitator role to the government and focuses on technical advice ensuring that home owners "build back better using disaster-resilient standards" (Government of Samoa, 2013:54). However, many residents had difficulties financing the rebuilding of their homes and sometimes could not afford it at all (ONE News, 2013a). Overall access to financial means to purchase materials for reconstruction was identified as an important constraint (Government of Samoa, 2013:59).

Assistance provided by the government included relief supply for reconstruction such as tents, tarpaulins, tool kits and household items. While the Disaster Advisory Committee's Sub-Committee for Housing Reconstruction and Settlement had originally recommended considering only families living in shelters or camps for this distribution (OCHA, 2012g) hand-outs were eventually given to families leaving evacuation centres as well as to those whose houses were destroyed or

severely damaged. The total cost of the distribution amounted to USD 792,700 (Government of Samoa, 2013:58; OCHA, 2013b). Furthermore, the Ministry of Natural Resources and Environment and the Fire and Emergency Services helped with the tree cutting and the latter continued to assist with cleaning houses until mid-January (Press Secretariat Government of Samoa, 2013a). Despite these assistance efforts some media reports suggested that little seemed to have been done in some areas such as the Magiagi village (ONE News, 2013b).

Apart from this direct assistance, the government also provided USD 5 million in housing assistance in the form of a loan scheme at the end of February. The loan was provided interest-free during the first year with a subsequent interest rate of 3 per cent. Mortgage loans could amount to USD 30,000 and personal loans to USD 15,000. The money is part of a USD 24 million package whose remainder was given to the Development Bank of Samoa to help the business community. It is lent to the Samoa Housing Corporation by the Central Bank. The CEO of the corporation stated that they were "barely making enough to cover our administration costs" (Samoa Observer, 2013b). While the low interest rate is attractive, it has to be pointed out that on the one hand some families require more money which would have to be loaned at the normal interest rate of 17 per cent (Tupufia, 2013b). On the other hand, few households took loans to cope with their recovery needs (Government of Samoa, 2013:115). Additionally, rumours emerged that only government employees were eligible for the scheme (Esera, 2013a). Even though these rumours were promptly dismissed by officials, the controversy nevertheless illustrates problems with the loan scheme approach (Samoa Observer, 2013b). Its main problem, however, is that while the scheme might be well-intended it does not actually help those most severely impacted by Evan, namely low-income families and poor subsistence farmers in rural areas. It also highlights a government dilemma that also applies to other developing countries faced with a disaster, namely limited financial resources. This problem was highlighted by the Prime Minister (ONE News, 2013a), who also pointed out that a lot of aid received from donors is earmarked and cannot simply be used for other purposes by the government (Hazelman-Siona, 2013). The Prime Minister also defended the government's prioritization: "In regards to housing not the entire country was affected or had their houses destroyed – only a small number due to strong winds and flooding but the entire island of Upolu was affected when the power went out" (ibid.)

This line was subsequently promoted by the Finance Minister as well (ABC Radio Australia, 2013c). This contrasts the 2009 tsunami response because there were a lot of overseas donations making the hand-out of rebuilding grants possible after the tsunami, but the government could not afford such an approach following Cyclone Evan as the international aid levels were different (ONE News, 2013b). In such a situation, non-governmental assistance becomes more important. With respect to rebuilding after Evan, examples of this include the OIL group who handed out cheques to assist employees with reparation (Samoa Observer, 2013c) and the Fellowship of Ministers Samoa New Zealand who provided vouchers for the purchase of building materials (Ta'ateo, 2013). Finally, remittances from family members abroad, which are important for many households' incomes in Samoa, have been identified as important for rebuilding as well (Government of Samoa, 2013; Esera, 2013b; Samoa Observer, 2013d).

Rebuilding faces many challenges and notable financial constraints, making recovery particularly difficult for low-income households. This is problematic as they are among the most vulnerable of the population. Therefore it is also questionable whether high expectations to build back better and in a resilient way will be widely met.

The complexity of relocation

One motivation to leave one's home could be the loss of livelihoods. It has been observed that seasonal employment schemes in New Zealand and Australia have attracted farmers to leave Samoa for job opportunities with higher incomes (Esera, 2013c). Though no rural household interviewed for the PDNA indicated the intention to change their livelihoods (Government of Samoa, 2013:114) these potential migration trends might be initiated by the effects of Cyclone Evan.[2] Another motivation could be the changed course of the Vaisigano River, that causes continued flooding of some houses especially in the Magiagi Valley whenever there is heavy, constant rain (ONE News, 2013a; Samoa Observer, 2013e).

Finally, moving can be motivated in anticipation of future impacts. Related to flooding and going beyond it the Prime Minister stated that "the valuable lesson following this cyclone is that we need to warn people that are living close to rivers that they ought to shift, as well as those who live very close to the coastal areas, that they need to shift" (ABC Radio Australia, 2013a). This call was reiterated by

2. This illustrates the blurry distinctions between different types of migration. While the seasonal employment schemes could be seen as economic/work migration some of it might in fact be motivated by the environmental impacts of the storm on the livelihoods of the migrants and their relatives who stay behind.

the Acting Chief Executive Officer of the Meteorology Office in light of mid-January floods caused by a subsequent tropical depression (Tupufia, 2013a). New Zealand engineers carried out a survey of the flooded area of the Vaisigano River. They recommended relocation aside reinforcing riverbanks and forcing buffer zones (ONE News, 2013a). Some people have already moved to higher ground (ONE News, 2013a). With approximately 70 per cent of the population living within one kilometre of the coast and critical infrastructure being primarily located in coastal areas (Government of Samoa, 2013:87), Samoa is highly vulnerable not only to flooding but also to tsunamis and eventually sea-level rise. Therefore it is understandable that relocation was highlighted by communities and the government as a key issue in the PDNA (ibid.:123).[3]

With respect to infrastructure, the assessment recommended the inland relocation of some health facilities (ibid.:47), the reconstruction of schools while ensuring that they are not – as was previously the case in Vaimauga West – located on an ancient riverbed or in a floodplain (ibid.:53) and the relocation of damaged water and sanitation stations from vulnerable to safer locations (ibid.:79). Additionally it was proposed that livestock be moved to higher ground and away from rivers and watershed areas (ibid.:25).

With respect to those recommendations, the feasibility of relocation appears as one of the main challenge. First, the availability of land – especially inland (ibid.:120) – is limited in Samoa and where available, its purchase requires substantial financial and time resources (ibid.:59 & 120). The land on higher grounds is particularly expensive and has oftentimes already been bought up by well-off people (Lesa, 2013). This makes it difficult, if not impossible, for low-income families, the most adversely affected by the cyclone, to relocate (Government of Samoa, 2013:59). Second, inheritance is a problem. On the one hand people do not necessarily want to leave what they inherited from their ancestors (Lesa, 2013). On the other hand, in Samoa customary land cannot be sold. This poses problems for affected families in vulnerable rural settings who have houses on their own land and would not necessarily find alternatives (Government of Samoa, 2013:59). Furthermore disaster threats often exist for entire villages so that moving within the village would not reduce the level of risk. This hints at a third constraint, especially for rural environments, namely the ties not only between a family and its ancestral land (and links to current livelihoods) but also within communities. These community ties would make it extremely difficult to live in a village one does not belong to (ibid.:120).

Therefore different attitudes towards relocation can be identified among the population of Samoa. Simply speaking some people want to stay while others want to move (Esera, 2013b). But a more nuanced evaluation can be made: there are indeed some, notably from rural areas, that do not want to relocate due to their attachment to their land and community and prefer rebuilding in a way that would be more resilient (Government of Samoa, 2013:120).[4] A second group has already moved to higher ground (ONE News, 2013a). A third group indicates an interest in relocating but is unable to do so mostly due to financial constraints (Government of Samoa, 2013:120). Thus the remark in the PDNA that most of the households seem to favour local reconstruction as the easiest and most affordable option (ibid.:59) obscures the fact that "easy" and "affordable" do not always equal "preferred". Finally, a fourth group of people interviewed for the PDNA was struggling with their daily survival or still reeling psychologically after the disaster so that they had not thought about relocation (ibid.:120). This means that proportions of those who do not want to leave, those who actually leave and those who would like to leave but cannot, might shift over time.

While the PDNA highlights the important point that "relocation cannot be imposed" (ibid.:123) the situation in Samoa post-Evan therefore illustrates the relationship between migration (relocation) and adaptation. Each individual should have the possibility to choose its adaptation strategy, that means between staying (and rebuilding in more disaster-resilient ways) or leaving. Both policies should be supported by government policies. This case study indicates that government actions favour rebuilding locally over relocation. The recommendation of the PDNA to "conduct a broad-based community consultation process for relocation that includes community wishes and needs as well as government considerations for change" (ibid.:123) does not seem to reflect the current situation but is a step in the right direction.

3. It has however been highlighted that major ongoing infrastructural projects such as the Apia Waterfront Redevelopment or a new government building were continuing (Press Secretariat Government of Samoa 2013b) while they might better be shifted inland (Lesa 2013).

4. This does not only refer to the reconstructed houses but also the livelihoods. One of the main lessons from cyclone Evan according to the Prime Minister was for example the need to place more emphasis on root crops that resist better to storms and could therefore limit food shortage as well as negative impacts on the livelihoods of (subsistence) farmers (ABC Radio Australia 2013a; Government of Samoa 2013:26).

CONCLUSION: THE STATE OF ENVIRONMENTAL MIGRATION IN SAMOA AFTER EVAN

Evan was the most damaging natural disaster to hit Samoa in recent years. It left 606 houses in need of reconstruction, caused an estimated value of USD 206 million of post-disaster financial requirements and displaced 7,500 people to evacuation centres at peak displacement periods (Government of Samoa, 2013:xiv) This highlights a couple of aspects of the state of environmental migration in 2012.

On the one hand this case study underscores the challenges faced by private households and the diversity of individuals' situations and needs. Some are stuck in temporary structures next to their destroyed houses because they cannot afford to rebuild. But even if reconstruction is affordable, this might not be what individuals actually want. The analysis of relocation attitudes suggests that some Samoans would prefer to relocate to less disaster-prone places but are unable to do so because of high relocation costs and no viable alternative destinations. They could, therefore, be considered as being forced to stay and policies should ideally facilitate out-migration. But at the same time many Samoans affected by the cyclone want to stay. For them, adaptation to disaster risks means building back better, adopting more resilient livelihoods and increasing disaster preparedness. In this context, the fact that none of the communities visited for the PDNA had a general disaster preparedness plan is worrying (Government of Samoa, 2013:108). Similar to post-tsunami disaster-preparedness education initiatives (Nemerever, 2012) cyclones need to be addressed by awareness-raising projects especially as they present the biggest hazard for the country. Government policies can support all of these elements through well-enforced and strict building codes or disaster preparedness campaigns. With respect to changing livelihoods, Samoa already has in place a stimulus package to incentivise farmers to plant traditional crops (Esera, 2013c). This could be modified to particularly encourage root crop farming.

Beyond this, this case study shows the need for nuanced policies. The coping strategy of individuals with respect to natural disasters, such as Cyclone Evan, varies largely, which can result from personal choice. Following Evan and with respect to relocation these were returning/staying and leaving. Ideally policies take this into account. Yet, this case study shows that government strategies are not always capable of doing so. With respect to Cyclone Evan, the problem was particularly financial constraints. International assistance was often earmarked to particular humanitarian or recovery objectives and the government did not have the financial resources to fund large rebuilding or even relocation projects. This was highlighted by the IMF, who suggested government caution against external loans and prioritization of grants as the public debt is high and the fiscal deficit would be increased by loans (Samoa Observer, 2013f). In turn, this implies that if no grant is provided the government faces the choice between increasing public debt or limiting disaster response measures. Therefore, much hope is placed in an insurance pilot launched by the World Bank in January 2013. Samoa, the Marshall Islands, the Solomon Islands, Tonga and Vanuatu participate in the Pacific Catastrophe Risk Insurance Pilot that will test whether a risk transfer arrangement modelled on an insurance plan can help small-island nations cope with the financial effects of natural disasters (The World Bank, 2013). For Samoa, the pilot programme would be particularly valuable since the government has indicated that it does not plan to request a postponement of Samoa's graduation from LDC (Least Developed Country) status scheduled for 2014 (Press Secretariat Government of Samoa, 2013b). As many developed countries set aside financial support particularly for LDCs, graduation could intensify public budget constraints of the Samoan government and therefore make it more difficult for the country to deal with future disasters.

For the future, Samoa must find resources to adapt to environmental challenges. With total economic loss and damage amounting to USD 203.9 million (Government of Samoa, 2013:xiii) and thus 18.1% of the country's GDP (CIA, 2013), cyclone Evan demonstrated that financial constraints are a main explanatory factor for response or rather non-response measures in Samoa.

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IN FOCUS

Responding to Hurricane Isaac: assessing evacuations and federal levee seven years after Katrina

Tania Boulot

Hurricane Isaac originated near the Lesser Antilles on the 21 August 2012 and was quickly upgraded to a tropical storm. On its way across the Atlantic, Hurricane Isaac caused significant damage and flooding in Haiti and the Dominican Republic. The Gulf Coasts of Florida, Alabama and Mississippi had been affected as well. Isaac reached Louisiana on the morning of the 28 August, hitting the coast seven years to the day after Hurricane Katrina. Even though Hurricane Isaac had been predicted as a Category 2 hurricane, it was downgraded to a Category 1 hurricane shortly before reaching the Gulf Coast, due to decreasing winds. However, this downgrading proved to be treacherous, because it led to an underestimation of the effects of Isaac's weak forward momentum, namely longer exposure, higher rainfalls and flooding totals. Additionally, this downgrading considerably reduced the willingness of the population in high-risk parishes to evacuate.

Measures of Evacuation

The mayor of New Orleans, Mitch Landrieu, had not ordered mandatory evacuations but had strongly encouraged those outside the levees to evacuate, making therefore the choice not to "err on the side of caution"[1], thus saving a definite amount of chaos. On the contrary, the Louisiana Government ordered mandatory evacuations for a number of communities in parishes likely to be the most affected, which to a large extent included those living in low-lying and sparsely populated areas. Overall, the emergency status was declared in 41 parishes, 7 of which were at least partially evacuated. Thousands of citizens were put in shelters across the State of Louisiana. The State government, with the help of the Department of Education, provided approximately 350 buses, evacuating those in need of shelter in large parts to the Jewella Shelter in Shreveport, or to a building close to Louisiana State University at Alexandria[2].

Nevertheless, a considerable amount of people stayed in their homes, often due to a lack of possibilities for fleeing and very limited financial resources. This demonstrates the insufficiencies of the evacuation and sheltering plans. Even though the mandatory evacuations were proclaimed in advance, and the evacuation measures had strongly improved since Katrina, the practical access to evacuation was not provided to all. In some parishes, such as Terrebonne and Lafourche, inaccurate predictions caused hasty last minute evacuations. Thousands of residents who had not evacuated needed to be searched for and rescued.

Reality check for the federal levee

Hurricane Isaac is an especially noteworthy case, due to the fact that it was the first real test for the newly reconstructed federal levee system protecting New Orleans. As a consequence of Hurricane Katrina, U.S. Congress approved plans for upgrades to the federal levee system in the value of approximately 14.5 billion dollars, now called the 2012 greater New Orleans area 100-year Hurricane and Storm Damage Risk Reduction System (HSDRRS). The major complex includes one of the most extensive storm surge barriers in the world and is today 133 miles long. Many had been anxious about the levees being able to hold back Isaac's storm surge, but it successfully withstood the test and shielded the inner parts of the New Orleans.

However, Isaac revealed that the protection of those inside the levees inflates the risks for those living outside the levees. As the U.S. Army Corps of Engineers confirmed, "in many areas outside the 100-year HSDRRS, water levels exceeded those from Hurricane Katrina and Gustav"[3]. Isaac inundated some parts of greater New Orleans, such as Laplace in St. John the Baptist Parish, which had previously experienced little to no flooding. For many in those places, the extent of Isaac's effects came as an unprecedented surprise, and demonstrated the lack of preparation in the region. The increased exposure of the areas outside of the federal levee disproportionately affects those citizens who are already disadvantaged, socially and economically.

Lessons learned

Isaac showed that the future of people living in these low-lying areas outside of the federal levee system is hardly predictable and sustainable if no decision is taken soon to extend the federal levee or to implement efficient and extensive mitigation and adaption measures. Louisiana's low elevational coastal zone is becoming increasingly vulnerable in the face of constant sea level rise, leading to an erosion of the soil and a thus increased frequency of floods and storms. Considering the risks and costs of living these low-lying delta regions, it is essential that changing residence or migrating be considered and proposed as an adaptation strategy.

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ASSAM AND THE BRAHMAPUTRA: RECURRENT FLOODING AND INTERNAL DISPLACEMENT

SABIRA COELHO

Assam epitomizes images of natural beauty: wildlife sanctuaries, tea estates and lush rainforests. It is the largest of the "seven sisters", the states that make up the north-eastern wing of India. Right through the heart of this state runs the Brahmaputra, the second largest braided river in the world, known for its meandering and frequent changes of course (Brahmaputra Board, 2013). The name Brahmaputra means "the son of Brahma", who in Hindu mythology is the creator of all humans and along with Vishnu, the preserver, and Shiva, the destroyer, forms the "Great Trinity". The Brahmaputra *created* Majuli, a river island situated mid-stream, by gradually depositing sediment to form an alluvial plain (ASI, 2004). However, the Brahmaputra over time is transforming into Shiva, evidenced by the destruction it has caused in the Assamese part of the Brahmaputra river valley. The most vulnerable to this destruction are the 168,000 residents of Majuli, who have been the victims of constant flooding of the river for decades (Census of India, 2013). The communities struggle to save themselves from the wrath of the river; some migrate out of the flood-prone region while others remain in temporary settlements along the riverbanks. Despite financial losses to the tune of INR 2 billion per year, government attempts to curb the damage are both negligible and ineffective (Kalita, 2013).

In the context of climate change, the frequency and intensity of flooding is likely to increase, implying that best practices for flood control need to be identified immediately; in cases where flood control is not possible, plans to minimize the impact on local populations need to be developed. Given that 9 per cent of the 40 million hectares of land prone to flooding in the country is located in Assam, tackling the problem posed by the Brahmaputra is critical for India (Kalita, 2013). Further, any effective policies in disaster management implemented in Assam could act as a prototype for other flood-prone regions of the country and even for other countries in South Asia, like Bangladesh, who confront the same issue. Also, solving the conundrum faced by Majuli, a sinking river island, would contribute to possible solutions for island nations that could face the same predicament in the future.

The first section of the paper will give an outline of the demographics of the region, including the existing migration patterns. The second section will discuss the floods (focusing on 2012) and consequent environmental degradation, its influence on demographic trends and the prospects in light of climate change. The final section will assess the policies relating to flood control and dealing with internal migration.[1]

1. KEY DEMOGRAPHIC CHARACTERISTICS OF ASSAM STATE AND MAJULI RIVER

1.1. Background

The State of Assam has a population of 31 million people, of which the majority is concentrated in the two river valleys of the region: in the Brahmaputra valley, that covers 24 districts, and in the Barak River, that covers 3 districts. Only 13 per cent of the total population lives in urban areas, far lower than the Indian average of 27 percent (Census of India,

1. Since compiled data on the floods and their impact on Assam (such as numbers affected, people displaced, etc.) are scarce, the paper will rely upon news reports and grey literature. It is interesting to note that these flood-related news reports are prominent only in the regional newspapers rather than the national the problem is perceived in India; it is newspapers, implying that access to information on the area is limited even in the Indian capital. This reflects how reduced to a 'regional' issue instead of a 'national' problem, much to the frustration of locals in the region.

2011). The population density in Assam of 396 people per square kilometer exceeds the nationwide rate of 382 persons per square kilometer (Census of India, 2011).

The main occupation of the Assamese people is farming (mainly of paddy) followed by work in the service sector or in crafts such as pottery. This high dependence on agriculture, where over 95 per cent of the people rely directly or indirectly on the land, is risky considering that 23 per cent of the state's cultivable land is vulnerable to floods or drought. As it is, Assam witnesses a higher incidence of poverty of 37.3 per cent, (in comparison to the rest of the country where the rate is 32.67 per cent) particularly in rural areas where 90.2 per cent live in poverty (Directorate of Economics and Statistics, Assam, 2011).

Within the state of Assam is the small river island of Majuli, bound by the Brahmaputra to the south and one of its larger tributaries, Subansiri, to the north. The island houses around seven different tribes who live in 243 small villages spread across the island (ASI 2004). Majuli is also the nucleus of Vaishnavite faith (a main branch of Hinduism), as it hosts 22 Vaishnavite monasteries. Each of these monasteries, known as sattras, imparts teachings to disciples, while also fulfilling civic functions like the settlement of disputes.

Majuli frequently faces the rage of the river. Following an earthquake in 1950, the Brahmaputra changed its course, eroding the island's area from 1,244 sq km to 514 km². The river's potential for destruction and creation of fertile lands through inundation has made it an integral part of Majuli's spiritual culture. It is for these reasons that the island lies at the heart of the Assamese civilization, with its intricate web of interaction between indigenous groups, the environment, spirituality and culture (Pisharoty, 2011; Choudhary, 2011).

1.2. Migration trends in Assam: Growing in-migration fuels ethnic tension

The state of Assam is extremely ethnically and religiously diverse. This plurality is reflected in the 200 different mother tongues that were spoken in 1971 (Assam Online Portal, 2013). This diversity can be explained by immigration into the region, which is facilitated by the state's geographical position between seven Indian states, Bangladesh and Bhutan. Entry points are therefore numerous for migrants who wish to benefit from the state's increasing prosperity. Yet, immigration can be traced back to the colonial period, when migrants from Nepal, Bihar and Bengal moved to Assam to work on the tea estates. Many of the Bengalis settled down in the Brahmaputra valley to cultivate the *char* areas (riverine land), which continues to influence the migration patterns of today. Two subsequent waves of Bengali immigrants followed Indian independence and partition in 1947, and Bangladeshi independence from Pakistan in 1971. Like before, these newer Bengali immigrants settled in the floodplains of the Brahmaputra River (Singh, 2008).

Over the past four decades, the influx of immigrants has persisted. Assam's population has been growing at a rate faster than the whole of India, despite a falling birth rate, which is attributed to heavy immigration flows from neighboring regions (Directorate of Economics and Statistics, Assam, 2011). Amongst the immigrants, there are second/third generation Bengali immigrants whose families have been in Assam for decades and have integrated with the Assamese culture, and recent immigrants whose culture is distinct from that of the older immigrants (Dasgupta, 2001). However, precise data concerning both recent and historical immigration flows remains scarce or completely inexistent in Assam. Though there are assumptions concerning high levels of illegal immigration from Bangladesh to Assam, the numbers are mainly speculated.

As a consequence of immigration, tension has been escalating in the region. Assam has become a hotbed of contention between the indigenous tribal population and groups of Muslims, who are believed to be illegal Bangladeshi immigrants (irrespective of their actual migration status, nationality and timing of migration). This friction has intensified to violent levels on several occasions, most recently in 2012 with the riots between the Bodos, the chief tribe in the state, and the Muslims (Bhattacharyya & Werz, 2012). This particular outbreak led 400,000 people to flee their home, considered as internally displaced persons (IDPs) (IDMC, 2012).

Many speculate that the influx of Bangladeshi immigrants is a consequence of adverse environmental factors, indicating that environmentally induced migration is already underway. According to Reuveny (2005), "when asked why they (*Bangladeshi migrants*) moved, they often provide natural disasters, land scarcity and degradation and poverty as reasons". These immigrant communities are vulnerable to environmental catastrophes as, according to a study conducted by Shrivastava and Heinen (2005), many of them continue to establish temporary settlements in low-lying areas highly prone to flooding. This is a consequence of the tension as immigrants are not welcome in the mainland towns and resort to setting up homes only in regions not densely inhabited by local populations,

which are, incidentally the low-lying char areas. On one hand, by settling there, these immigrants free themselves from the risk of ethnic conflict as these regions are mainly traditional "ghettos" of the Bangladeshi communities, but on the other hand, they expose themselves to natural disasters like flooding (Dasgupta, 2001).

Emigrants from the state of Assam represent a negligible amount of all internal migrants in India, only 0.22 percent. Over half of the 700,000 Assamese emigrants were women, migrating for more than half of them for marriage purposes (Census of India, 2011). However, there is considerable rural-urban migration within Assam. This increased urbanization, coupled with industrialization has caused significant environmental degradation that correlates with the increasing destruction caused by floods (TERI 2008).

2. FLOODING OF THE BRAHMAPUTRA RIVER

2.1. The Brahmaputra's geomorphology and the impact of the floods

Originating from the Kanglungkang Glacier in Tibet, China, the Brahmaputra River traverses the Tibetan Plateau before bending into Arunachal Pradesh in India, after which it runs through Assam, merges with its tributaries in Bangladesh and drains out into the Bay of Bengal. Along the rumbling journey from a high altitude in Tibet till the Assam valley, the river picks up a large load of sediment, making the river highly unstable in the upper reaches of the Assam Valley. With deforestation caused by shifting cultivation - a particular method of cultivation, often employed in South Asia, soil erosion has increased, which in turn has increased the amount of sediment carried by the river (Sharma, 2012). In addition to a large amount of sediment, the river also carries a large volume of water. The Brahmaputra has over a 100 tributaries, of which 15 large ones originate in the north due to the melting of snow on the Eastern Himalayas (Ghosh & Dutta, 2012). Once the river enters the Assam Valley, the silt is deposited, leading to a change in the slope of the river, erosion of river banks, frequent migration of the river's course and heavy floods as the river cannot contain the volume of water (Sharma, 2012). To exacerbate the situation, the region receives high amounts of precipitation (in the range of 1100-6500mm) and is a seismically active zone (NDMA 2008). This high amount of rainfall during the monsoon season is equally to blame for the river's deluge. Landslides and flash floods occurring due to a combination of all these factors are, as a natural consequence, extremely common. Unfortunately, the disaster does not end there; a vicious cycle follows the onset of landslides, as the falling debris block the course of the river, forcing it to flood elsewhere (TERI, 2008).

Due to these factors, the flood-prone area in Assam totals to 3.1 million hectares, which is 40 per cent of the state's area, of which, 560 villages dotting the banks of the Brahmaputra are particularly vulnerable (TERI, 2008; TNN, 2013) Every monsoon, the state experiences flooding, with major floods occurring at least once every four years (Directorate of Economics and Statistics, Assam, 2011). Despite the suddenness of such events, the government has ample warnings of their potential magnitude and should be therefore able to implement flood-control measures to minimize the destruction. However, they still cause immense destruction: 931,000 hectares are affected each year, eroding at least 8,000 hectares annually. According to the Assam State Government (2013), at least 7.4 per cent of the total landmass of the state has been eroded since 1950. Financially, the cost of major floods is extremely high - INR 7.7 billion in damages to utilities, crops and houses when Assam was badly hit in 2004 (Kalita, 2013). Majulihas also been heavily eroded due to the annual inundation of the Brahmaputra and the migration of the rivers bounding the island. Between 1998 and 2008, the island lost an average annual amount of 5,000 hectares, while 14,834 hectares of land remain constantly under water (Dutta, Barman, & Aggarwal, 2010). Subtracting this land from the island's total, along with the land unsuitable for agriculture and the land reserved by the government, only 32,237 hectares, or 25 per cent of the island's total area remains available for cultivation (ASI 2004).

2.2. The floods in 2012: How relief efforts were obfuscated by outbreaks of violence

In 2012, a first wave of floods occurred from April to June as it crossed the danger mark by 43.8 cm, with subsequent waves of flooding in the following months. As of the 21 October 2012, the Assam State Disaster Management Authority (ASDMA) stated that 2.9 million people were affected, from 3,354 villages (ASDMA, 2012).[2] Dhemaji, Morigaon, Dhubri, and Lakhimpur, the most densely populated districts in Assam were worst affected by these floods. The government set up 340 relief

2. No updated date could be found.

camps at the peak of the flooding, mainly in school buildings, to provide assistance to 485,000 people. Furthermore, 67 raised platforms and 188 shelters were also constructed. On the 28 August 2012, 17 of the 23 relief camps sheltered a majority Muslim displaced persons. Despite governmental efforts, many communities remained outside the relief camps because the government didn't have the capacity to provide shelter to all of them and were struggling to survive by setting up temporary shelters. These populations were even more vulnerable to subsequent waves of flooding than those in the camps (ASDMA, 2012).

Following the floods in 2012, 36,000 people were actually living on the dykes constructed to protect Majuli and that this number had risen by 6,000 from the previous year (TNN, 2012). As floods had deluged the whole island, the government needed to evacuate large numbers of people living on these embankments. However, relief efforts were obfuscated due to the geography of the island.[3] As a sign of the government apathy, the President of Congress Sonia Gandhi and the state minister aerially surveyed the flood affected areas (ACTED, 2012). Damage to infrastructure like highways further disrupted any quick attempts at providing relief to the population. To aggravate the flood situation, riots also broke out in July, creating an additional challenge during the relief efforts and leading the state into a complex crisis.

According to situation reports by the International Federation of Red Cross (IFRC, 2012), the IDPs on the riverbanks and trapped populations in Majuli were facing dreadful living conditions as food, water, shelter, health and sanitation facilities remained lacking. The government provided them with staples of rice and dal (lentils), nutrient supplements and baby food for children. The floods had destroyed the hand pumps, the main source of clean water, and the provision of purified water was therefore extremely critical. The government also provided tarpaulin sheets that were however insufficient for the large numbers of IDPs and certain relief camps were extremely make-shift. Fortunately, there was no epidemic outbreak following the floods, though IDPs suffered from malnutrition (IFRC, 2012). In the context of humanitarian crisis, provision of education was extremely difficult (TNN, 2012). Relief efforts following the retreat of the monsoon seemed to slowly dwindle down; funds became scarce since donors believed that flood-affected populations returned to their homes as the displacement was supposed to be only short term (Joseph, 2012). In reality most families have nothing to return to as the lands are still submerged. For those able to go back to their re-merged areas of origins, they often face challenges in getting back their lands due to unfair relocation processes (Dasgupta, 2001). Many of them may remain permanently displaced persons within Assam, yet close to their original villages (Dasgupta, 2001).

A great polarization on the basis of different ethnicities is found amongst IDPs, due to the ethnic tension that has been bubbling in Assam for years (Dasgupta 2011). Based on this diversity division among the communities themselves, camp managers have divided the displaced population because of fears that violence would erupt between the polarized groups of IDPs. The composition of the camps reveals that majority of the displaced, are Muslims followed by members of marginalized tribes, acknowledgement that interrogates on the linkages between daily persecutions and marginalization and vulnerability to natural disasters Dealing with the tension between the originating tribes and the Muslims is therefore very sensitive during the relief phase, as resettlement and return always raises issues regarding land ownership and legitimacy. Several tribes argue that the land is their rightful property and that the Muslims should vacate it, while the latter refuse to do so arguing that they have been farming there for years. If Anandita Dasgupta (2001) professor at Guwhati University argues that "the use of violence, dispossession, murder, and confiscation of crops and animals have almost become established patterns of *char* life", they seem particularly sensitive during post-disaster relocation processes. Considering therefore environmental factors but also ethnic tensions as incentive for displacement, it is difficult to ascertain the exact degree of environmental influence in the displacement processes – an important consideration to keep in mind in the labeling process of such displaced groups.

2.3. Is growing out-migration a consequence of recurrent floods?

With the flooding of the Brahmaputra over the years and the subsequent slow-onset event of erosion of riverbanks, there has been large displacement of people every year. Whole villages have been erased or washed away due to the force of the river. Unfortunately, official statistical databases for the number of villages displaced and details regarding the relocation of the population - where they move to and how they survive - remain vague.

3. Usually one needs to take two ferry rides across the river to get to Majuli, but during the floods when the water was at dangerously high levels, traversing the river was near impossible. Army helicopters were thus used for dropping essential supplies like packaged food and drinking water to the marooned population, but could not land on the island because it was submerged.

Table 1. Number of erased villages in ASSAM

District	Number of "erased villages"
Dhubri	71
Jorhat	2
Kamrup	14
Goalpara	75
Chars (Riverine areas)	181

SOURCE: TNN

Revenue Minister, Prithivi Majhi, though, states that data collection is underway (TNN, 2013). This collection of information is likely to be an arduous task as with recurrent inundations, villages located in low-lying char areas, separate over time to combine with different villages in the high lands, as seen in a study conducted by the NGO Arayanyak (Das, Chutiya, & Hazarika, 2009). Similarly, in Majuli, according to the state government, since 1969 approximately 9,566 families have been left homeless due to land erosion. The government has relocated only 500 families, leaving the approximately 10,000 remaining displaced peoples to fend for themselves (Choudhary, 2012). Since government resources provide no information on this relocation, Mr Choudhary was interviewed for an insight into the state of the displaced persons. These populations, according to the journalist, have been relocated to "some other villages. They now survive on farming, a few on fishing; others have taken up petty jobs. They have coped since survival is inherent to them."[4]

The damages of floods on livelihoods are tremendous. With increased siltation, fertile land is no longer productive, rendering Assamese farmers landless with very limited opportunities to find remunerative employment (TERI, 2008). Thus, these populations, dependent on agriculture, livestock production and fishing, either abandon their lands and homes in search of work by migrating to other cities where they become rickshaw-pullers or cart-pullers earning dismal daily wages, or remain displaced (Pisharoty, 2011; Dasgupta, 2011). Many of these displaced persons especially vulnerable to labour exploitation and trafficking (Dasgupta, 2001).

Information available on relocation of displaced villages and families and on out-migration of Assamese living on the banks of the Brahmaputra is based on newspapers. As reporters note, many of the youth leave the difficult flood-ravaged regions with few employment opportunities to work in big cities in other states like Kerala, in the south or Nagaland, which is also within the north-eastern region (Das et al. 2009). These youth migrate on a temporary basis to earn a modest income, which they remit back to their families for making repairs, buying food and maintaining livestock. Though these remittances are useful, there is a decline in the workforce for agriculture, which increases the burden on the older generation who stay behind (Das et al. 2009). However, the youth work initially as seasonal farmers on the less flood-prone, fertile lands, before migrating for the rest of the season. (Das et al. 2009) Others migrate over short distances to northern districts to engage in menial labour like pulling rickshaws (Dasgupta, 2001; Das et al. 2009). In Majuli, the youth, often more educated than the older generation, have migrated to the southern city of Hyderabad in search of work. At the same time, many in Majuli do not have the resources to migrate and remain trapped on the island (Pisharoty, 2011).

Following the Bodoland riots in 2012, the visibility of the Assamese "ghettos" in other parts of India became more visible, as their population increased due to a mass exodus of Assamese people (Devulapalli, 2012). This large number of Assamese workers in other Indian states suggests that first, people are emigrating from the state not only in search of jobs, but perhaps also as an adaptation strategy to deal with the floods and infertile lands. Second, it suggests that though census data reflects low out-migration from Assam, the figure is possibly higher than estimated. Migration flows, therefore, are changing in Assam due to the impact of the Brahmaputra on the lives of the local population.

Based on the newspaper reports and other sources of data, the state's migration flows can be summed up as follows: first, temporary intrastate displacement during the monsoon seasons with return to the homeland when the lands re-emerge; second, permanent intrastate displacement to embankments faced by the poorer and marginalized IDPs; third, permanent migration of whole villages, which are proactive in order to avoid the floods; and fourth, long-distance, interstate, temporary and seasonal migration for additional economic reasons. It is interesting to note that, apart from the last group of migrants, most others remain fairly close to their original locations.

The likely reasons behind migration, and how one is affected by the floods in Assam, include level of education, income and occupation. Public sector employees are less likely to be displaced because they have a secure livelihood despite frequent inundations. Furthermore, those who have higher levels of education are more adaptable to migration, as they have better skills, making the probability of finding employment higher. Income is also important in migration as the people in the

4. Interview with Ratnadip Chaudhary, Principle Correspondent, Tehelka, conducted on 30 March 2013 via email.

high- and middle-income groups sometimes already have property in safer areas to where they relocate (Choudhary, 2011). Thus, those who cannot move away from the floods are the peasants and the indigenous tribal groups who are bound to the land. Culture is a second important determinant in migration. For the tribal populations inhabiting the riverbanks, coping with the flooding is natural to them. The Mishing tribe for instance, builds houses on stilts, known as 'Char ghars' that have been emulated by governmental relief programmes. This riparian culture of the tribes often impedes them from migrating too far from the river, owing to sentimental attachment, implying that these communities are highly unlikely to migrate long-distances and for the long-term (Das et al. 2009).

2.4. The climate change challenge

Climate change is likely to have an extremely adverse effect on flooding and erosion in the region. First, since rainfall is currently one of the root causes behind overflowing of the river, any increase in precipitation as predicted in a few studies outlined in the State Action Plan on Climate Change is likely to make the floods more extreme (TERI, 2008). Second, since the river also receives glacial run-off through its tributaries, the rapid melting of snow due to global warming will also increase the volume of water that the river holds (Sharma, 2012). Hence, floods are likely to become more frequent and more destructive in the near future, which may also accelerate out-migration from the region. Though this latter process allows people to cope with the disaster, there are many questions concerning relocation that need to be addressed.

First, in the case of Majuli, the protection of cultural integrity is an imperative. Due to the changing course of the river, the people living in Assam have imbibed migration as a trick for survival, migrating within ten kilometers or to entirely new districts in the upper reaches of the river to avoid flooding. This adaptation mechanism has a detrimental impact on culture, as villages do not move in totality, because of population density constraints (Das et al. 2009). In Majuli, the number of sattras has declined from 65 to 22, and in the event that the island becomes engulfed by the river and its inhabitants have to relocate, it is likely that the translocation of these monasteries will not be successful (Choudhary, 2012). In this context, believers of the Vaishnavite faith fear the erosion of an important part of their culture along with the river island. Consequently, it is important to think not only of how to preserve populations, but also their unique cultural identity when formulating rehabilitation plans.

Second, increased out-migration from the floodplains is also likely to create a labour shortage for the farms that are not submerged. Furthermore, it is likely that this out-migration will be a generational issue as the youth is more willing to migrate in search of work, leaving their parents behind to work on the land. Third, given the ethnic divisions in Assam's society and the hostility faced by IDPs and immigrants, increasing migratory movements due to environmental factors is likely to be a huge challenge. As it is, when the Bengali Muslims living in riparian areas migrate upwards during the floods, locals view this as an influx of new illegal immigrants from Bangladesh (Dasgupta, 2001). In the face of climate change, dealing with these challenges will be essential.

3. POLICY ANALYSIS

Given the destruction caused by the floods each year, the state and central government have implemented a series of disaster management policies in order to curb the harm caused by the floods. Large-scale floods that occurred across the country in 1954 prompted the Indian Government to look into flood control measures. Since then, the government has taken steps to implement this objective by creating the High Level Committee on Floods (1957), the Ministers Committee on Flood Control (1964), the Rashtriya Barh Ayog (National Flood Commission, 1980) and Task Force on Flood Management/Erosion Control (2004) (NDMA 2008). In December 2005, the government enacted the Disaster Management Act, which established the National Disaster Management Authority (NDMA), which presides over the State Disaster Management Authorities (SDMA), Disaster Response Forces and the State Funds for Disaster Relief. This approach was expected to ensure an integrated disaster management approach in the whole country (NDMA 2013), while the direct responsibility of relief, rescue and rehabilitation measures lies in the hands of the state governments concerned.

In addition to the SDMA, each state must adopt a State Disaster Management Act to identify responsibilities and coordination mechanisms. For flood management, State Governments and local authorities need to refer to the guidelines put down by the NDMA when developing action plans. Below the state level, district-level and village-level bodies have been created with the responsibility of disaster response and relief, mitigation and prevention at the district level. In case of a disaster, it is these bodies that coordinate the functions of local authorities, health facilities and primary schools (Ministry of Home Affairs, 2005).

In Assam, the ASDMA (Assam State Disaster Management Authorities) works within this institutional framework. The ASDMA has taken both structural and non-structural measures for flood preparedness. Structural measures to mitigate flooding include the construction of embankments, water reservoirs, retention basins and buildings on elevated areas. Non-structural measures include flood-forecasting mechanisms and floodplain zoning that check uncontrolled settlement in vulnerable areas (ASDMA, n.d.). A flood-hazard atlas has already been developed for each of the districts in coordination with the Indian Space and Research Organization. An *Assam Relief Manual* also exists, though it was created in 1976 and does not include preparedness strategies (TERI, 2008). Additional measures include building community awareness, stockpiling emergency essentials, creating early warning systems, identifying areas for settlement, conducting drills, and developing coordination plans with NGOs and other local organizations (ASDMA, n.d.).

In addition to the ADSMA, developing a master plan for flood control in the Brahmaputra valley is under the jurisdiction of the Brahmaputra board, created by the central government through the Brahmaputra River Act in 1980. This master plan for the control of floods and erosion entails the construction of "multipurpose dams", which would provide extra benefits like hydroelectricity and irrigation. In 2003, protection of Majuli was placed under the responsibility of the Brahmaputra board (Brahmaputra Board 2013).

When developing an effective strategy for flood control in Assam, it is pertinent to look at policies influencing migration trends in the region. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has been reported to alter the rural-urban migration flow in other states of India as it provides 100 days of guaranteed employment in rural India. However, according to research conducted by the Agro-Economic Research Centre, the scheme has had little impact on slowing down this trend in Assam, largely due to the fact that the days of work promised by the act was not yet a reality in the state and, as a consequence, wages in urban centers still remained higher than those provided by the MGNREGA (Bordoloi, 2011). Thus, the rural populations in Assam (and perhaps many living on flood ravaged river banks) consider migration to cities as a better option, adding to the rapid urbanization of Assam. In the absence of urban policies or policies protecting internal migrants in India, these populations are often very vulnerable, given a low priority by the government and have no social or legal protection (UNESCO, 2012). In fact, the only policies in Assam dealing with migration call for the detection and deportation of illegal immigrants, implying that cross-border migration occupies the public discourse far more than internal migration (Singh, 2008).

4. KEY CHALLENGES IN ADDRESSING THE FLOODING AND DISPLACEMENT IN ASSAM

Firstly, the institutional capacity and resources among the state and district authorities may be too limited to implement the outlined priorities. The ASDMA's Annual Report 2012 outlined that State Disaster Response Force consists of only 263 personnel, with roughly 11 from each district. In 2012, ASDMA conducted 1,482 training programmes and workshops to build capacity among different demographic groups like health professionals, students and teachers, volunteers and NGOs. Though such programmes indicate a positive step, they were able to reach only 457,145 participants, which is very low given that 2.9 million people were displaced in 2012 (ASDMA, 2013). This dearth in capacity leads to a dependence on external assistance from non-local bodies, which do not coordinate well with the existing NGOs and other informal institutions set-up in the state (ASDMA, 2013)

Secondly, existing policies do not take into account ground realities. The training programmes, for example, seem to target very specific communities, i.e. those people with a basic level of education, with the risk of marginalizing communities living in rural or remote areas. In a state like Assam where only 73 per cent of the population is literate, developing effective training programmes that empower those who are illiterate is crucial (Directorate of Economics and Statistics, Assam, 2011). Additionally, floodplain zoning, which prevents people from setting up houses on the riverbanks, is not implemented in Assam due to the state government's argument that the thick population density in the state impedes the implementation of such a policy (Planning Commission, 2011). Though the government's claim has merit, a check on human activity in these floodplains must be ensured in order to prevent such a damaging effect year after year.

Thirdly, the construction of multipurpose dams for flood control is also questionable. In the midst of frantic construction of three dams upstream on the Brahmaputra by China, India seems to have forgotten the central objective behind building dams of flood control, and focuses instead on ensuring the hydroelectric opportunities of the river (Orland, 2013). Until now, embankments have not only been ineffective in controlling the damage, but

actually further aggravate the situation by creating drainage issues in areas outside the dam (Das et al., 2009). In addition to creating instances of dam-induced flooding, these dams have also been responsible for displacing populations (mostly indigenous people, sometimes comprising of whole tribes) but this is often brushed aside as the displacements in the north-east are "relatively small" in comparison to other parts of India (Vagholikar, 2011). Furthermore, apart from the construction of new dams, old embankments need to be repaired. In 2012, 74 embankments were breached during the flooding according to Water Resources Minister, Rajib Lochan Pegu. The minister also added that, "3,918.82 km of a total 4,773.82 km of embankments have surpassed their effective life-span", implying that 82 per cent of the embankments in Assam were technically beyond their expiry date (Kashyap, 2013). Lastly, such dams do little to control siltation, which causes as much damage as inundation (Sharma, 2012).

In Majuli, despite the construction of a few embankments and the recovery of land in the form of sandbars, no concrete moves have been taken to avoid further erosion. In order to ensure the cultural identity of Majuli, the State Government applied to UNESCO for the status of "World Heritage Site", on the premise that recognition of the island's cultural value would increase both national and international attention for its protection (ASI, 2004). Unfortunately, the island remains on the list of nominated sites. Assam's flooding problem also gets lost in the politics between the central and the state government. The Assamese believe that the central government remains apathetic to the situation. Protests led by the Assamese Student Union against negligible budget allocation to the strengthening of embankments and for the declaration of annual Assam floods as a national problem, rather than a state problem are frequent (TNN, 2013). The central government reiterates however, that this is a state issue, despite Chief Minister Tarun Gogoi's assertion that the debt burden of the floods is too immense for the Assamese government to handle on its own (North East News Agency, 2003). However, the state government has received INR 11.38 billion from the central government to tackle the flood challenge, which is far more that the INR 8.32 billion recommended by the Task Force on Floods (Kashyap, 2012). Furthermore, the state government has demanded funds to respond to annual floods but despite receiving the requested money, projects are still delayed. Skeptics question whether the funds are actually being employed, or simply siphoned off (Chaudhary, 2012).

This slow implementation of schemes, according to a member of the Central Water Commission, is supposedly the reason behind the slow release of funds. The absence of state representatives from Assam in the first meeting for the working group on flood management for the twelfth five-year plan was also symptomatic of the apathy on behalf of the state government (Planning Commission, 2011). Another indication of the ASDMA's lackadaisical attitude is evidenced by fact that the 1976 draft of the "Assam Relief Manual" was revised for the first time in 2011 (Henriques, 2011).

Coordination between ASDMA and NDMA is also lacking. As a recent audit by the Comptroller and Auditor General on the NDMA revealed, it is "ineffective in its functioning in most of the core areas." (Supreme Audit Insitution of India, 2013). Key projects like hazard mapping have not been completed, while poor inter-governmental agency communication is a hindrance to the disaster management process. Furthermore, rescue and relief teams were inadequately trained, while the disbursement of funds was delayed (Supreme Audit Insitution of India, 2013). Though the report included eight state-specific observations, an audit of ASDMA was not undertaken. However, given the lacking capacity of the national agency, ASDMA has little support and guidance from the central government to deal with disasters effectively. The Brahmaputra Board also lacks coordination with the state government: set up by the central government, the control of its activities remains in New Delhi (Government of India, 1980). States should be given increased control and autonomy over the determination and enforcement of their flood control master plans.

International coordination to manage the Brahmaputra's water resources is fairly tense, despite cooperation on other riparian systems in India, as suggested in the rejection of a recent Indian proposal for a new mechanism on water sharing by China (PTI, 2013). Despite this attempt by India (advocated by the central government) to improve international coordination, political will to do the same amongst north-eastern ministers is weak. For example, Mr Gogoi, Assam's state minister argued that when flood management coordination between north-eastern states remains deficient, international cooperation on the matter remains out of the question (North East News Agency, 2003).

A last challenge with the floods occurs with the retreat of the monsoons. As the rains disappear, so does attention to the issue. However, many IDPs continue to live in relief camps and issues with nutrition, health and sanitation remain. Some IDPs in camps are even forced to leave, since the camps located in school buildings need to reopen (Joseph, 2012). The crux of the issue lies in the fact that the IDPs are not legally recognized. The Guiding Principles on IDPs as formulated by the UN are not recognized by India and not implemented by the Assamese Government (Dasgupta, 2001).

CONCLUSION

Though the basic structure for flood management has been established, policies are often misguided and worsened by the lack of attention given to north-eastern states due to the region's limited political clout. Instead, both the central and state governments need to coordinate and strengthen their institutional capacities in order to successfully employ a multipronged approach looking at different dimensions - social, economic and environmental - that will be most effective at alleviating the situation. At the outset, it is essential for the government to safeguard the rights of IDPs, which includes recognizing them, particularly in the context of ethnic violence. The ethnic challenge acts as an impediment to relief efforts and so policies to encourage economic and social development among tribal and marginalized Muslim populations should be a priority. Furthermore, livelihood support for those whose lands have been destroyed needs to be provided by the government, rather than just provision of food supplies following the floods. The existing policy misses the point that crops were sold for monetary purposes and not merely for sustenance (Talukdar, 2013). To prevent the problem of food and job insecurity following the floods, the government should consider providing training for agriculture in flood-affected areas, and targeting particularly and youth to increase the labour force in case of young males migrating (Das et al., 2009).

With regard to migration, policy makers are oblivious of the temporary migration among the tribes that allow them to survive (Das et al., 2009). The government also fails to recognize migrant flows- both into and out of Assam - that are crucial in order to draft policies dealing with unplanned urbanization and to effectively manage flood control. To begin, the Government could consider facilitating migration of these tribes. It should also create a temporary and circular migration scheme within the country that may also help redistribute income to the north-east through remittances. They could be used to ensure that these tribes have sufficient resources in the face of flooded agricultural land.

Local knowledge, particularly among the tribes with a strong riparian culture, should also be tapped into by ASDMA (Das et al., 2009). The ASDMA could utilize the existing networks to more efficiently provide aid to those in needs. In Majuli, in particular, the sattra is a key informal institution that is non-discriminatory and overarches all aspects of life from education to disputes with its giant halls called 'namghars' where the villagers collect. Thus, imparting knowledge of flood preparedness from these institutions would ensure local mobilization. The community-run early warning systems for floods in the disaster prone area from Assam to Bangladesh is an example of the role informal institutions can play in disaster management (NDMA, 2008). Effective policies need to include civic participation and since "NGOs are ready to take up the issue but government is in denial" as Mr Choudhary argues,[5] it is useful to increase their engagement prior to and during the floods.

As for structural measures, steps to deal with the excessive silt carried by the river also need to be taken when constructing dams. As Nayan Sharma (2012), a professor at IIT Roorkee asserts, "a massive soil conservation campaign is needed to effectively reduce the sediment volume of the Brahmaputra, along with the creation of flood detention reservoirs, river training for erosion control, land reclamation and channelling." Sharma also suggest that India takes a leaf out of China's flood management book by using similar technology for sediment control as used on the Yangtze River.

The lack of accurate data is a huge challenge, which mires the whole relief operation as the numbers affected are undercounted. The state government needs to update its databases and keep a record of the number of inhabitants of all villages (TERI, 2008). A good practice of ASDMA was the daily reports published on the floods in 2012, which kept an account of numbers in relief camps and those affected including livestock. By looking at these reports, it is easier to determine trends and best practices that can help formulate effective policies for the years to come.

Finally, flood preparedness and disaster risk mitigation needs to be streamlined into development policies. There is hope that the government is moving in this direction, as it recently approved a IDR 1.16 billion project to ensure economic development, social improvement and preservation of the remaining 22 sattras in Majuli (PTI, 2012). Thus, for the people of Assam, while the Brahmaputra continues to destroy, preservation and creation lies within the hands of the government.

5. Interview with Ratnadip Chaudhary, Principle Correspondent, Tehelka, conducted on 30 March 2013 via email.

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IN FOCUS

Australia and its swift disaster response management

Nicole Schmidt

Australia is no stranger to natural disasters. However, the country's environmental vulnerability to climatological and hydro-metrological disasters has been dramatically increasing since 2010 with the recurrence of one major flood every year. The Queensland floods in 2010/2011 inundated 80 per cent of the state and heavily impacted the national economy as well as local communities. The International Disaster Database EM-DAT estimated the damage to be USD 7.3 billion. 35 people died during the incident; 175,000 were affected and in immediate need for assistance such as food, water or shelter supplies (The OFDA/CRED International Disaster Database, 2013). Just one year later, in February and March 2012, Victoria, Queensland and New South Wales were hit by yet another flood commonly referred to as the Eastern Australian floods. Fortunately, the number of people affected was significantly smaller (13,300) and no casualties were reported.

"Global best practice"

Operating under the internationally recognized principles of "Prevent, Prepare, Respond and Recover**"**, the management of Australia's evacuation process, especially during the Queensland disaster, has been quite frequently referred to as "global best practice" (Arklay, 2012) in recognition of their particularly well handled crises management.

The advantage of being developed

Australia has access to several types of ressource that make it easier to act quickly and efficiently. However, the magnitude of the Queensland floods in 2011 exceeded the country's capacity during the evacuation process and called for additional help. Therefore, the Australian Government's Department of Defense provided an Australian Division Force (ADF) team to help assist in the recovery efforts. The defense personnel carried out a number of different tasks: from searching for bodies and performing rescues, to airlifting people to safety or delivering medical supplies, to the distribution of food and more than two million liters of purified water, especially in isolated communities to prevent a future health crisis (Lahey, 2011: 15-16). Thus, the ADF was effectively coordinating the evacuation, relief efforts and recovery support.

Swift coordination

The strong coordination, not only within the ADF, but also among all branches of the government – local, state and federal – in responding quickly to the disaster, is one of the factors that was handled particularly well during both emergencies (Clarke, 2013). The good working relationships among the police, emergency service personnel and local councils were considered to be very effective. Certainly, the special establishment of the Queensland Reconstruction Authority overlooking the emergency management for the disaster in 2011, and later in 2012 too, has been a key factor of a well-organized coordination of relief and recovery disaster management. Funds were made available immediately for those who had not sufficient insurance coverage and there was an immense national outpour of help from fellow Australians in general. Most people whose houses had been flooded stayed with family or friends but the government also set up additional emergency crises camps.

Make use of social media

The increasing use of social media has been another driving factor for making the evacuation process both in 2011 and 2012 successful. As the affected areas were surveyed, it became clear that many households were unable to watch TV or make use of their landline phones due to the flooding. Therefore, Australia's emergency management began spreading information and updates on the current disaster management situation through different channels such as Facebook and Twitter because people still had their mobile phones. The Queensland police for example began spreading information as soon as people had to be evacuated and at the height of the Queensland flood disaster, more than 35,000 tweets containing the hashtag 'qldfloods' were sent via Twitter (Mellick, 2013; The Brookings Institute, 2012). Since then, social media has become a key factor in providing useful information to the general public before, during and after a disaster.

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IN FOCUS

Mozambican floods and resettlement processes

Geraldine Zambrana

In early January 2013, Mozambique suffered from the most catastrophic floods the country had seen since 2000. The floods affected 300,000, killing 117 and displacing approximately 200,000 people (INGC, 12/03/13). The disaster affected the provinces of Zambezia and Gaza. If the government does not effectively respond, the migration will cause overcrowded cities, like Maputo.

Case Study: The resettlement site in Chiaquelane

Chiaquelane, the largest long-term resettlement site, consists of 1,123 families divided into 5 "Bairros".[1] The site lacked adequate security and electrical, health and WASH provisions. In contrast, most of "Bairros" from Lionde – the affected town from which most of people come to Chiaquelane - have adequate facilities, though not all of them are close to the resettlement site. This could represent a problem in convincing people to resettle. In some cases, the site of origin is more than 20 km away, and the population does not have access to farming land close by. They must therefore go back to their site of origin in order to cultivate. Populations indicated that they return on a weekly basis to their site of origin. There is a high rate of return. In fact, Chokwè is historically marked by migration flows. Chiaquelane's population increased rapidly during the 2000 floods that struck Chokwè which is historically marked by migration flows. But once the floods ended, the temporary settlements were disassembled and families returned to their old residencies in the lowlands.

A general reluctance among affected populations to relocate after a natural disaster has been recognized in the literature. More recently, Patt and Schroter (2008)[2] related this phenomenon in Mozambique to differing perceptions of climate risk among resettlers, policymakers, and program managers. This study suggests that many farmers were aware of the risks that flooding posed but returned to the floodplains mainly because they were unable to establish a viable livelihood in their new locations. This finding underlines the importance of ensuring that resettlement communities in Mozambique are socially and economically viable as well as physically robust in an infrastructural sense, echoing the limitations of state-led relocation programs in earlier periods. Displaced people have a connection with the land and are reluctant to move because they also do not want to become dependent on public projects.

The government's goal is to identify and give away 4,830 plots, the majority of them on the higher ground of Chiaquelane (IRIN 13/02/13). Kaisa Nugin an expert from OCHA stated that "*Chiaquelane was used for resettlement during earlier flood events (2000/2001). By combining the old village with the prior resettlement, Chiaquelane will ultimately develop into a larger urban area*"[3]. We might ask ourselves if there could be a possibility that Chiaquelane become a city of environmental migrants. As people are returning, there are also people considering staying at the resettlement site.

At any rate, if the Government intends to make Chiaquelane a resettlement site, it has to make the space "a good place to live", with basic infrastructure and public services, as well as proper livelihood support. NGOs and development actors should accompany this action by raising awareness about environmental disaster risks, living in community and political and historical influences in developing attachments to a particular territory.

1 « *Report matrix origin- Ressettlement site* » by IOM Mozambique, April 2013.

2 Patt, A. and D. Schroter (2008) 'Perceptions of climate risk in Mozambique: implications for the success of adaptation strategies'. *Global Environmental Change.* 18(3). pp. 458– 467.

3 UNEP/OCHA JEU / Kaisa Nugin, MSB, ENVIRONMENTAL ASSESSMENT Flooding in the Gaza Province, Limpopo River Basin, Mozambique, April 22, 2013.

IN FOCUS

Disaster response in Nigeria: Managing the largest displacement of 2012

Sora Kim

In 2012, Nigeria experienced massive rainfall from July to November. The unexpected floods killed hundreds, injured and displaced millions. Even if this accident needed prompt actions to deal with the emergency, the government failed to respond effectively because they were unprepared -lacked the data and plans- for the large number of displaced.

Inundation starting from July brought about release water from four major dams in the Niger and Benue Rivers. Floods resumed in September and further hampered relief work and the rehabilitation process. At the end of September, most states reported receding water levels whereas delta and Bayelsa states had no signs of decreasing water. It took much more time for water to recede given that water corridors were larger than any other year and drainage channels were not working properly. Heavier seasonal rains coupled with a poor drainage have threatened 19 states out of 38 mostly in the southern region of the country. Unexpected water run-off was not timely managed with contingency measures and severe rain storm caused the overflow of water reservoirs.

The National Emergency Management Agency (NEMA) has prioritized data collection and provision of relief supplies in cooperation with the Nigerian Red Cross Society (NRCS). NCRS is working jointly with the Nigerian Government urging better trained responders to manage emergency response. Mainly, the Nigerian government provided the contingency plan in response to sudden onset natural disasters including camp management, emergency shelter and non-food items. Moreover, the Nigeria Immigration Service (NIS) and IOM agreed on training 21 national migration officials with the goal of creating the National Intelligence Unit (NIU). In 2011, IOM launched two-week training, Promoting Better Management of Migration in Nigeria, providing interview techniques, data collection and management. Also, International Federation of Red Cross and Red Crescent Societies (IFRC) is helping the NRCS distribute aid more effectively by providing health care, water, sanitation and hygiene of makeshift camps and distributing non-food. (Sep, 2012).

The government needs to address several challenges such as the lack of data and the shortage of camp management capacity. Setting up an accurate terminology for the displaced people and providing legal support are essential. In addition, the government should train officials to carry out timely interviews of the displaced people, gather information, and manage the aftermath of a disaster. International cooperation between NGOs, UN Agencies and the private sector is key to react properly and effectively to disasters.

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PART 2 MOBILITY, RESETTLEMENT AND RETURN

DESERTIFICATION AND DROUGHT RELATED MIGRATIONS IN THE SAHEL – THE CASES OF MALI AND BURKINA FASO

NAKIA PEASRON AND CAMILLE NIAUFRE

INTRODUCTION

Migration on the African continent occurs mainly internally within countries as well as subregionally across borders, with West Africa representing 42 per cent of all regional movements (Black et.al, 2004). Farmers have historically moved mainly between neighboring countries due to "artificial boundaries demarcating socially homogeneous units into separate states" (Adepoju 1991:45; qtd. Ammassari, Black, 2001). Both Malian and Burkinabé farmers that straddle agricultural and political borders have long employed a substantial part of their household labor force to work on secondary cocoa and coffee fields in the Ivory Coast during the Sahelian dry season[1] (De Haas et.al, 2002; Konseiga, 2007).

While having long engaged in migration as a livelihood diversification strategy against the fragile Soudano-Sahelian climate, low-income and landlocked Mali and Burkina Faso have found it difficult to liberate their populations from the debilitating episodes of recurrent droughts and erratic rainfalls that have plagued the Sahel for the last half-century. Since the 1969-73 droughts, both countries have experienced increased north-south internal migration, as farmers and herders escape the descending "sahelization" of the countries' northern regions (Albergel, Valentin, 1990).

That the two neighbors rely on rain-fed agriculture for sorghum and millet staples as well as for cotton exports, makes their economies and food security highly vulnerable to changes in temperature and rainfall. In light of the 2012 Sahelian food crisis following a major drought that has thus far affected 19 million people in the region, and a projected 135 million people worldwide at risk of being displaced from desertification, land degradation, drought (DLDD) (Almeria 2006), the need to bring to the forefront the complex, yet widespread impacts of slow-onset climate events, is crucial.

1. They would return to cultivate cotton and grain at home during the rainy season July-September.

This paper considers how mobility patterns, already part of a traditional survival strategy in this climatically adverse region, are affected by recurring droughts and ongoing desertification. The first section describes the climatic, environmental and population conditions in the Sahel region, and briefly shows how closely their impact on migration is related to food security issues. Two successive case studies of migration patterns in Mali and Burkina Faso are here presented, including data collected from Pearson's field study in Burkina Faso in 2012. The final section summarizes existing policies related to migration and environmental issues and provides some recommendations.

1. ENVIRONMENTAL THREATS AND MIGRATION

1.1. Variability of Sahel rain conditions

Normal Climate Variability

Situated in the Western Sahel, between the Sahara Desert to the north and coastal rainforests to the south, Burkina Faso and Mali are intertropical countries marked by a Sudano-Sahelian climate, and are prone to strong geographic variation in annual rainfall as presented in the table below:

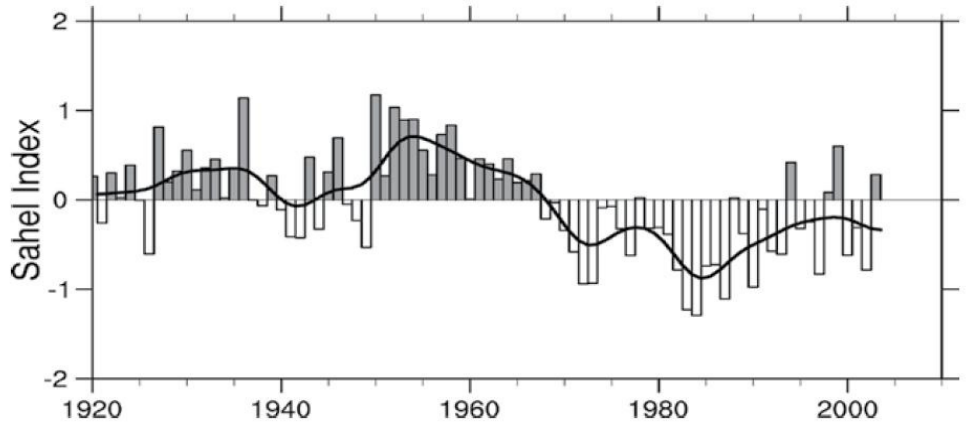
Table 1. Annual rainfall in Mali and Burkina Faso

Regions	Mali	Burkina Faso
Annual rainfall in North	50 mm	350 mm
Annual rainfall in the South	More than 1000 mm	More than 1000 mm

Source: Authors; Data Source: Hummel et al., 2000; World Bank Dashboard Overview Burkina Faso, 2013

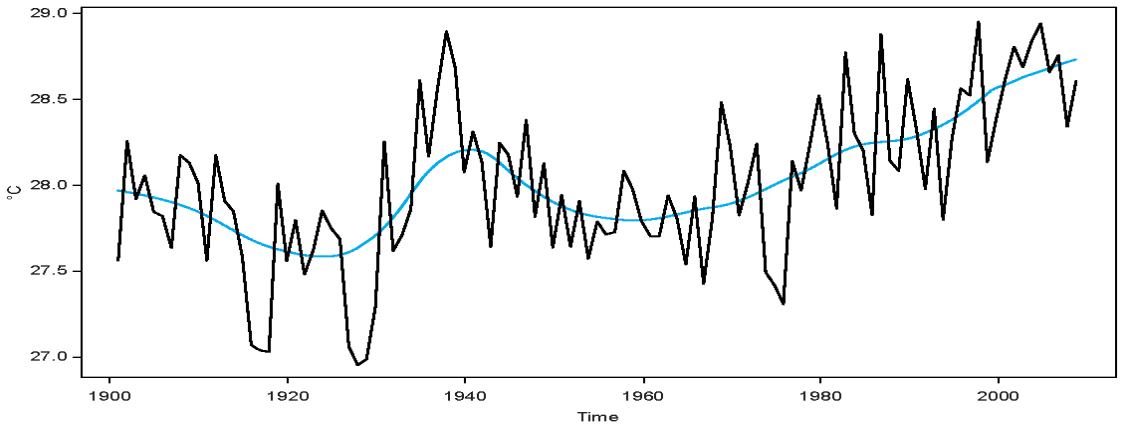
Rain is mostly concentrated in 3-4 months of summer rainfall (May-September), when temperatures are high, thus accelerating evaporation rates. Intra-seasonal droughts are common, since rainy seasons consist of many high intensity storms (OSS, 2007).

Figure 1. Annual rainfall variability in Sahel



Time-series of Sahel (10°N–20°N, 18°W–20°E) regional rainfall (April–October) from 1920 to 2003 derived from gridding normalised station anomalies and then averaging using area weighting (adapted from Dai et al., 2004a). Positive values (shaded bars) indicate conditions wetter than the long-term mean and negative values (unfilled bars) indicate conditions drier than the long-term mean. The smooth black curve shows decadal variations. [WGI Figure 3.37] Extracted from IPCC, 2008:80, fig. 5.2

Figure 2. Annual mean of daily mean temperatures in Western Africa



Extracted from Hummel et al., 2000: 22

Increasing climate variability

UNEP (2011) classifies the major drought events of 1968-1973 and 1982-1984 as part of an ongoing drought period starting in the 1970s, and interrupted occasionally by one-off seasons of adequate rainfall. But while precipitation rates have improved since 1993, there have been longer successions of dry years, and single humid years, particularly 1994, 1999, and 2003 (Ali 2010). Furthermore, this increased humidity has not been uniform across the Sahel. Rain indices show that isohyets have increased in the eastern Sahel (from Chad to eastern Niger) in the period 1994-2006, while they remain low in the western Sahel (from Senegal to western Mali) (*Ibid*). Additionally, the timing of annual rain cycles is increasingly variable as precipitation may decrease only at the end of dry seasons rather than in the beginning (*Ibid*).

On the temperature side, the Intergovernmental Panel on Climate Change (IPCC) predicts a warming of Africa by 0.2°C to 0.5°C per decade, with even higher temperatures expected in Sahelian, Central and Southern Africa (IPCCC, 2007). In the Sahel, the rise of temperature could reach +2.7 to +4.5°C between 2000 and 2025. These predictions are still uncertain, and their distribution unequal between Sahelian countries, but the potential for amplified evaporation of surface water[2] and penury of water resources would strongly impact food security, whether in agricultural, pastoral or fishing sectors.[3] In Mali, the production of rice by con-

2. 40 per cent of the rainwater in the Sahel is not absorbed by the land and runs off.

3. For instance, fish captures in the Malian Niger Delta went from 110,000 tons in an average year (as in 1966) to

trolled submersion, organized mainly by the Office du Niger in the Ségou, Mopti and San Region, is bound to disappear by 2025 if the IPCC predictions of rain reduction are realized (UNFCCC Mali, 2000).

1.2. Desertification and land degradation

Arid West African soils inherently suffer from poor fertility, exhibiting limited water retention capacity, limited nutrient value, and reduced depth for root extension (Lahmar, 2011). When erosive crusts, or *zipelle,* develop, they block infiltration, initiating a vicious cycle of desertification (Valentin, Casenave, 1992). The chemical depletion of soils sparked by the human elements of deforestation, bush fires, and over-cultivation, all help to reduce organic material through oxidation and the leaching of unused nutrients (PAN-LCD, 1999). Such soils, having lost their physical and chemical integrity, are more easily swept away in the dust storms or violent rains that occur during the later part of the rainy season (World Bank Dashboard Overview Burkina Faso, 2013).

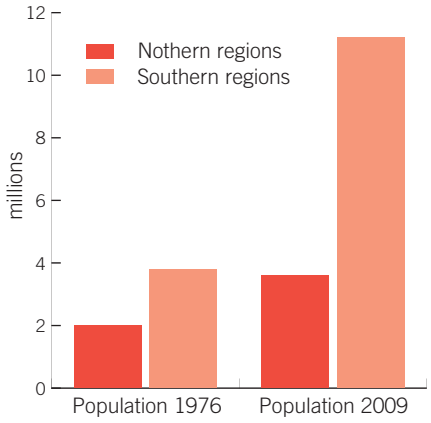
According the UNCCD (2008), 47 per cent of Burkina Faso's land is degraded, while 37 per cent is at high risk of degradation, most of which in the densely populated Central Plateau. Likewise, Mali has witnessed a strong degradation of the vegetal cover since the 1950s, leaving only 14 per cent of its total surface arable (UNFCCC Mali, 2011).

1.3. Population Pressure

Following the trajectory of Sub-Saharan Africa, the total Sahelian population has increased fourfold since the 1950s, growing at a 2.7 per cent rate between 1960 and 1990, and will likely double between now and 2030 (Ozer and al., 2005).

In Mali, the total population grew from 4.6 million in 1950 to more than 15.3 million today (UN World Population Prospect, 2010). If this extremely rapid rate is maintained, the Malian population could reach 30 million by 2030 and more than 42 million in 2050. This population is increasingly concentrated in the cities, with the capital city of Bamako having already reached 1 million inhabitants. Southern regions are the ones experiencing the fastest growth, as shown in Figure 3.

Figure 3. Evolution of the Malian population by region



Similarly, Burkina Faso has one of the fastest growing populations in Africa, with an annual increase of more than 3 per cent in 2001-2010 (UNEP, 2011). As in Mali, migrants move southward from the populous Mossi plateau in northern and central Burkina, where naturally erosive soils are further degraded by longer dry seasons, driving farmers to the fertile East and West (PAN-LCD, 1999; Brown, Crawford, 2008). But while rural regions are emptying out in Mali, thereby posing a threat to its primary sector that constitutes 47 per cent of the country's GDP, studies have shown that rural out-migration is beginning to stagnate in Burkina Faso, while internal urban out-migration is on the increase (Beauchemin, 2004).

These trends put a serious additional pressure on land resources and production. Sahelian farmers have had to expand their farmland despite declining soil fertility and increasing weather vagaries.[4] Researchers have linked the rate of rural population growth (35.6% in 2007) to the rate of increase of cultivated surfaces (40.8%) (Cambrézy and Sangli, 2011). Ouedgraogo et. al's (2010) study in Sissili province in southern Burkina Faso found that the annual rate of conversion of forest land to cropland at 0.96 per cent has increased simultaneously alongside population density from 17 inhabitants/km² in 1986 to 30 hbts/km² in 2006, due in part to migration since the 1980s droughts.

This phenomenon is also present in Mali where the FAO estimates a loss of forests of 100,000 ha/year. Here, it is mainly due to biomass energy

54,000 tons in a dry year (as in 1984), which represents a diminution by 50% (UNFCCC Mali, 2000)

4. The primary sector employs over 80% of their active populations and represents 35% GDP in Burkina Faso and 47% GDP in Mali. This share is bound to be reduced as the rural regions are emptying out (see **Fig. 3**). Food insecurity could be experienced in the coming years, further triggering migrations, whether from northern to southern regions or towards foreign countries.

consumption: wood and wood coal covers almost 90 per cent of energy production in Mali, and consumption is rapidly growing alongside population rates (respectively +21% and +50% between 2000 and 2006). Additionally, landclearing thousands of hectares of land by brush fires contributes to rapid deterioration of soils (UNFCCC Mali, 2000, 2011).

Furthermore, in Burkina Faso, despite the persistent droughts in the region, cattle populations have doubled from 1997 to 2008, to 8,072,420, leading to disequilibrium between the number of livestock and available resources.[5] In the Central Plateau where Mossi farmers and Fulani herders have long cohabitated, mounting pressures on natural resources and converging production systems (mixed cropping and pastoral farming) are increasingly ending in conflict (Breusers, Nederlof, Van Rheenen, (1998).

1.4. Environmentally-induced migrations are framed by food security concerns

Desertification and droughts represents a major risk for food security

The 'distress migration' that followed the 1980s Sahelien drought was characterized by rural-rural flows over shorter distances, serving as a key survival strategy for keeping poor households from starvation (Black *et al,* 2004). The most recent drought of 2012, which has affected 18.7 million people (FAO, 2012), on top of the 10 million people affected by the 2010 drought (Aljazeera, 2012), may be having the same effect.

Burkina Faso has been considered one of the most affected countries of the 2012 Sahel food crisis, which inflicted a 20 per cent loss in cereal production from the previous year due to droughts and environmental degradation (FAO, 2012). Similarly, Mali could lose up to 30 to 40 per cent of its agricultural capacity due to climatic changes (Hummel et al., 2012). Furthermore, declining national harvests could raise world market prices, leading to long-term food insecurity. Already, millet prices had increased by 104 per cent in Bamako, and 91 per cent in Ouagadougou between 2007 and 2012, the highest increases in the sub-region (Oxfam, 2012).

5. Given that each square kilometer of national territory could nourish 16 bovins, 23 ovins, and 29 caprins. Based on statistics presented by Dr. Augustine Kaboré from INERA, Ouagadougou

Migration flows in Burkina Faso and Mali - Key figures

Mali:

Around 200,000 permanent migration flows per year
Almost 300,000 displaced by the 2012 conflict and 177,000 refugees (including 48,000 in Burkina Faso).
46 000 total international migrant stock 2005

Burkina Faso:

2,2 million permanent internal migrants total counted in 2006
230,000 recent internal migrants 2006
773,000 total international migrants 2005
54,000 recent international immigrants 2006

Sources for Mali: 1992-1993 Malian Survey on Migrations and Urbanization (EMMU), quoted by Hummel et al., 2012, UNHCR, OCHA, 2013.
Sources for Burkina Faso: RGPH, 2006

The link between slow-onset events and migration

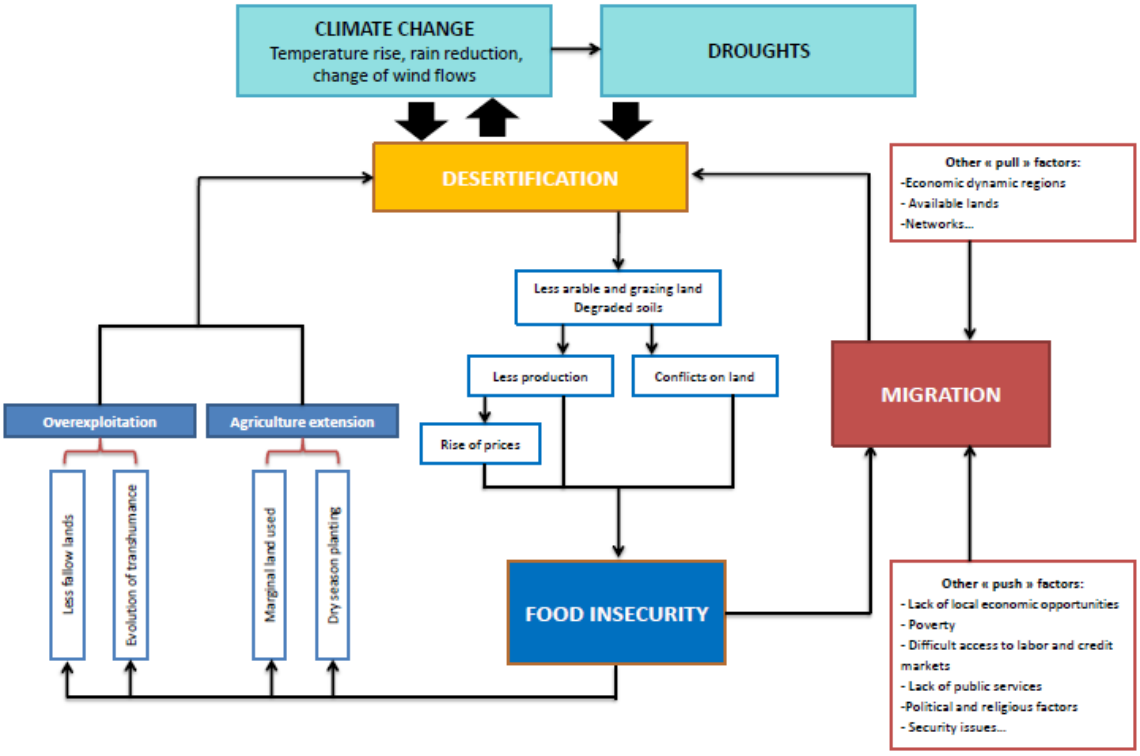
Severe, irreversible forms of slow-onset events that have a lasting impact on natural resources tend to lead to permanent moves while sudden natural disasters spur more temporary migration (IOM, 2011; Tacoli, 2011). However, the initial coping strategies of seasonal and circular migration during extended periods of drought and loss of agricultural production can very well evolve into permanent migration as a survival strategy when food security becomes problematic (IOM, 2009). Jónsson (2010:12) puts it bluntly: "permanent abandonment of an environmentally degraded area is rather a solution, and immobility would indeed be a major constraint, in some cases certainly resulting in continuing degradation and death from starvation".

Reactive food security strategies exacerbate soil deterioration

In response to the normal climate variability and related food vulnerabilities of the Sahelian region, rural populations tend to resort to adaptation strategies to survive in the short term, hoping for a milder rainy season the following year, regardless of the long-term impacts. Smit and Skinner's (2002) climate change behavior typology differentiates spontaneous responses such as selling off livestock as short-range and operational, while structural changes in management such as livelihood activities is strategic and long term (cited, Stringer *et al.,* 2009). However, short term adaptive strategies leading up to migration, or failure to migrate, can worsen long-term soil fertility loss.

Farmers often face deteriorating environmental conditions by expanding their fields onto marginal lands, which has put forests as well as wetlands in

Figure 4. Desertification and reactive responses to food insecurity: a vicious circle leading to migration



Source: Authors, 2013.

danger (IUCN, 2010). Mali counted 1.967 million ha cultivated in 1970 against 3.472 million ha in 1990, with the same productivity levels (UNFCCC Mali, 2000). Likewise, new land cultivation has led to a reduction of Burkina Faso's savannahs from 93,113 km² to 83,801 km² between 1992 and 2002 (Cambrézy and Sangli, 2011). Earlier planting seasons, often during the dry season, precipitate soil regeneration. Traditional fallow periods, sometimes as long as several decades, allowing lands to "rest" and recover fertility, have been shortened to as little as five years, risking complete soil exhaustion (IUCN, 2010).

Overgrazing is another important cause of environmental degradation. This relationship remains unclear: while a stronger concentration of animals on small pastoral areas further deteriorates the vegetation cover,[6] their manure and urine are excellent fertilizers. However, herd movements can lead to the export of animal manure, thereby depriving grazing areas of much needed fertilizers that could compensate for vegetation loss.[7]

The graph above attempts to conceptualize the linkages between desertification, migration and food security:

Increasing climate irregularities and the resulting soil degradation linked to recurrent droughts and demographic pressures become particularly problematic in poor countries like Mali and Burkina where livelihoods and daily sustenance are heavily dependent on natural resources. Migration remains a common survival strategy. Yet, new challenges such as increased risk of conflict resulting from resource competition and tenure insecurity in destination areas, as well as new vulnerabilities presented by the feminization of urban migrants, are being met with alternative migration patterns and adaptation strategies.

2. IMPACTS ON MIGRATION FLOWS

Mali and Burkina Faso present highly similar profiles, on climatic, social and economic levels, and on the effects climate change and environment deterioration are impacting their already fragile populations. On the migration aspect, both countries experience more internal than international migration, and more short-distance

6. See examples in UNEP 2006; Mortimore 2000
7. Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

Table 1. Destinations Destinations of migrants according to the region of origin in Mali, 2005

region	migration rate (%)	destinations of migrants (%)				
		rural areas	Bamako	other cities in Mali	other countries in Africa	outside Africa
Kayes	0,16	8,9	19,6	16,3	31,5	23,8
Koulikoro	0,12	15,2	25,1	29,9	27,8	2,0
Sikasso	0,16	6,6	26,2	21,4	39,7	6,2
Ségou	0,12	7,9	46,2	24,2	21,7	0,0
Mopti	0,16	22,6	30,7	15,0	28,0	3,7
Tombouctou	0,32	6,6	50,6	16,8	24,8	1,1
Gao	0,23	4,3	25,0	30,1	35,9	4,7
Kidal	0,34	19,0	2,4	11,9	66,7	0,0

Source: Hummel et al., 2012: 45; Database: CFSVA, 2000

than long-distance mobility. They also see their urban population growing as a result of the cities' economic and demographic dynamism. Nevertheless, when looking at migration patterns, divergence is clear. In Mali, most of the mobility forms part of a seasonal migration of rural populations towards the city during the dry season, more of these movements becoming permanent and thereby amplifying the phenomenon of rural exodus (Hummel et al., 2012).[8] In Burkina Faso, while seasonal migration is increasingly permanent, rural outmigration is slowing down while migrants are starting to leave urban areas for rural ones (Beauchemin, 2004; Pearson, 2013; UNEP, 2011).

2.1. Internal migration flows in Mali: cyclical and adaptation mobility

Seasonal rural-urban migration in Mali: the environment as a normal cause for mobility

Internal migration represents 43% of total Malian migration (EBSAN, 2009)[9]. Since the 1960s and the rapid growth of the cities (Denis, 2010), stimulated both by demographic expansion and the rural population movements, seasonal migration has become part of the agricultural population's normal livelihood strategy. During the non-harvesting dry season, when less labor is needed in the countryside, a part of the rural population moves to the cities, earns money through short-term jobs (Konaté, 2013), and eventually returns to their fields to plant during the rainy season. Most often, farmers do not permanently abandon their land to live in the cities (Jónsson, 2010).[10] Today, the majority of the Malian population (66%) remains in rural areas (Hummel et al., 2012).

A large scale study launched in 2009 by the Malian government (ESBAN, 2009) showed that 40 per cent of the households had sent one member away and had received remittances in the previous six months. Upon return to their villages, seasonal migrants bring home their savings to support the family. In this way, seasonal migration serves to alleviate financial strains on the household budget, particularly in regards to diversifying livelihood sources and risks like climate vulnerability (Jónsson, 2010).

Origin and destination

Permanent internal migration in Mali is inter-regional (ESBAN, 2009). Cities are the main destinations for migrants, as illustrated in figure 5, except for the Kidal region, where two-thirds of the migrants leave to neighboring countries like Niger or Algeria. Bamako is the principle destination for most migrants, who comprised 33 per cent of its population in 2009 (Hummel et al., 2012). The second 'hotspot' for permanent internal migration is the central region of Ségou, where the activities of the Office du Niger attract more than 40 per cent of internal migrants. The Office du Niger,

8. See also Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

9. International migration represents thus 57%, mainly towards other African countries, and only 8% for migration outside of Africa (EBSAN, 2009).

10. See also **Phone Interview** With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

created by the French colonial authorities in 1932, is today an 800,000 ha irrigated land dedicated to ensure Malian food security, mainly through rice-cropping. Its dynamism and job opportunities explain its power of attraction in terms of internal migration (Hummel et al., 2012).

The Mopti region, situated at the cross-section of northern and southern regions, is estimated to bear a moderate migration deficit, compensated by immigration from the north. Generally speaking, a clear north/south movement appears when studying Malian permanent internal migration (see map below). This mobility is impacted by three main factors: first, the northern regions are dryer than the southern ones[11]; second, northern regions, whose population density is lower, are poorer than southern ones; third, the majority of the economically dynamic cities are in the southern half of the country (see figure 6 below). Seasonal migration movements follow the same general North/South and rural/urban areas pattern (Hummel et al., 2012).

Consequences of desertification and food insecurity on mobility patterns

The consequences of desertification on migration are not immediate, but progressive, which makes it difficult to establish a strong correlation between the two phenomena. Nevertheless, it has been established that a degradation of environment conditions do increase migration rates. According to a 2009 study, an estimated 42 per cent of households intensify their seasonal mobility in the event of poor harvests, sending more members on the roads, while 17 per cent migrate when there is crop destruction, and 13 per cent leave in the case of strong climatic events or shocks such as extreme droughts or floods (EBSAN, 2009).

Episodes of extreme drought increase the numbers of inter-regional migrants. Moreover, international and long distance migration shifted to migration over shorter distances in order to sustain the aggressive cereal and livestock shocks caused by the 1983-85 droughts (Findley 1994).

Alternative patterns

The arid Kidal region, populated by a majority Tuareg population, is a notable exception to the general migration patterns in Mali: 85 per cent of migration movements are occurring within the region (EBSAN, 2009). The remaining migrants are mainly crossing the nearby border with Algeria, often for transhumance and nomadic purposes (see table below). The region's capital city, Kidal, is rather isolated from the rest of the country, as 1,200 km separate it from Bamako and 300 km from the nearest city, Gao.

Specific attention must finally be dedicated to a relatively new trend in internal migration: women now account for almost half of the migrants (Hummel et al., 2012). Going to work in the cities during the dry season is now a general custom for many young women, often between 13 and 18-years-old, to earn financial resources to support their family, but also to gather the content of their wedding trousseau (Sieveking, 2009). Local

The Tuaregs and the Fulani – Mali and Burkina Faso's Fluid Populations

The traditional way of life of the nomadic and semi-nomadic Fulani pastoralists and Tuareg merchants living in both Burkina Faso and Mali, involves transhumance migration, i.e., long-distance movement with cattle in search of pasture and water, thought of as a traditional coping strategy in vulnerable climates (De Brujin, Van Dijk 2003). In Mali, these movements have occurred between the Sahel regions (namely the Kidal, Gao and Timbuktu regions) and areas closer to the Niger River during the dry season, whereas in Burkina Faso they have occurred mainly in the Sahel and Central Plateau regions. However, the practice of transhumance has been substantially affected by the droughts of 1973 and 1984.

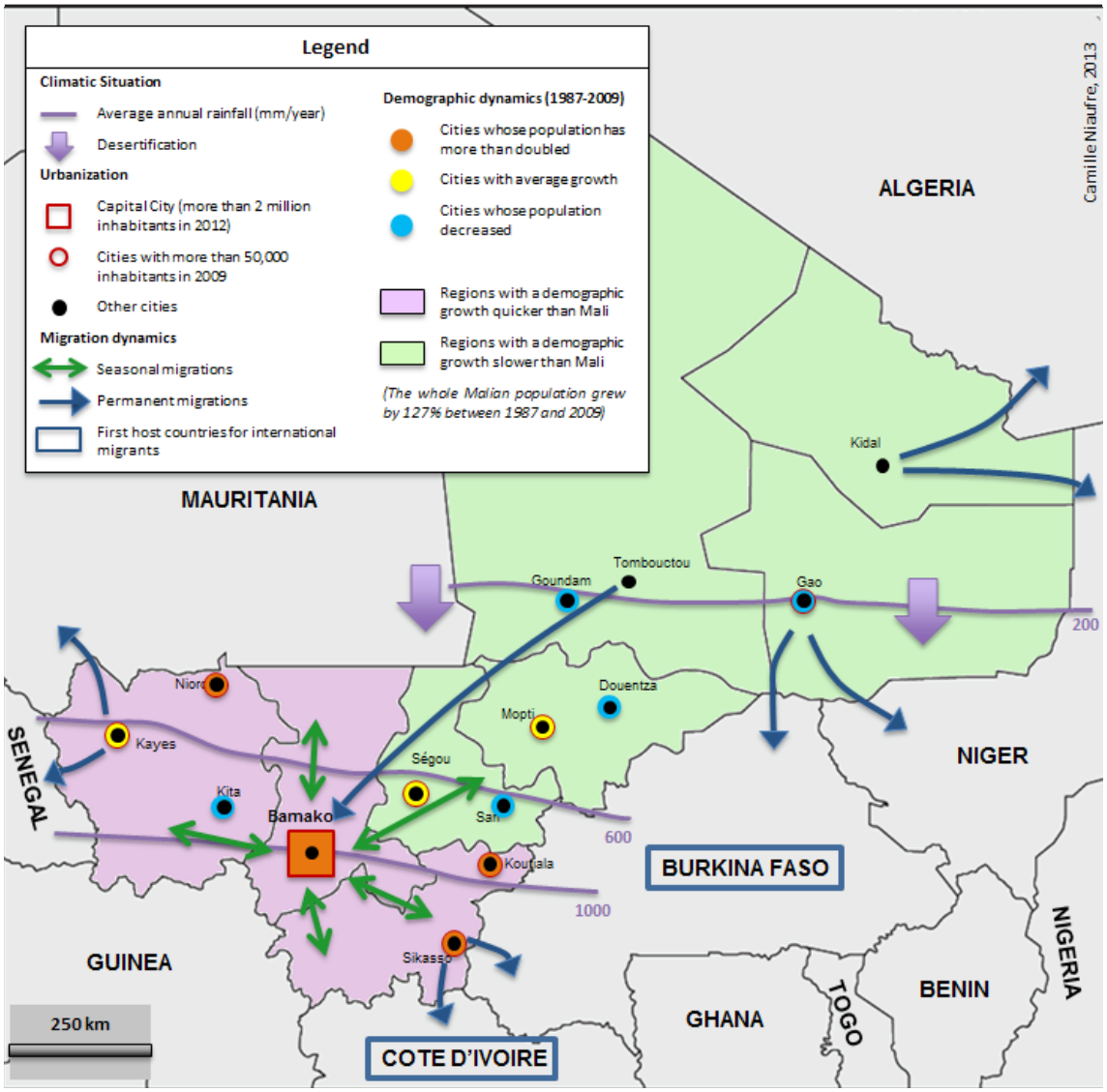
Distances have decreased substantially (often to less than 10km a year), and movements are more confined to the rainy season. Instead of whole families leaving, transhumance has been limited to a few young men going alone with cattle. However, with fewer cattle to tend to in the dry season, seasonal urban migration has been reluctantly pursued by Fulani men as a survival strategy.

In Burkina Faso, this group has engaged the most in permanent out-migration from the Sahel due to a failure of pastoralist livelihoods, or feelings of shame, which made it difficult for seasonal migrants to return (Hampshire, 2006).

Still, in Mali, a large portion of this population has become sedentary and diversified its way of life, settling mainly in northern cities where they practice agro-pastoralism (Hummel et al., 2012). Today, the distinction between farmers and pastoralists is no longer as strict as it used to be (Interview FAO Mali, 2013). The herders still following transhumance paths are entering more and more in competition with farmers for the use of land, as desertification reduces the available arable and grazing land.

11. They are also the ones affected by desertification. Green savannahs surrounding the cities of Kaarta and Bélédougou in the North-West, the Niger Delta, Dogon country and Liptako-Gourma have become semi-desert. The Sahelian steppe that used to reach Timbuktu and Menaka are now parts of the advancing desert (UNFCCC Mali, 2000).

Map 1. Migration and Demographic Dynamics in Mali



Source: Authors. Datasource: UN World Urbanization Prospects: the 2009 Revision - Mali Country Profile by the FAO, 2013 - Hummel et al., 2012 - Jónsson, 2010 - UNFCCC Mali, 2000, 2011 - Mortimore, 2000 - OSS, 2007 - UNEP, 2006 - IPCC, 2007

populations appear to be more concerned about female migration, as many never return to their native village.

The 2012 political and security turmoil has weakened the national food system

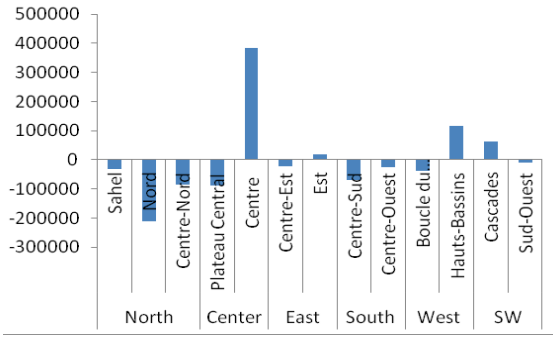
The conflict in Northern Mali in 2012 and its occupation by Islamic groups have provoked the cross-border movements of thousands of displaced populations and refugees. The military confrontations in January 2013, following the French intervention, triggered even more people to move away from their native region.

In February 2013, the United Nations reported 177,000 refugees, mainly in Mauritania (75,000), Niger (54,000) and Burkina Faso (48,000) (UN Dashboard, 2013), provoking troubles for the host regions, including in terms of food security. In March 2013, according to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), more than 280,000 people were displaced within Mali because of the conflict. Almost 30 per cent of Internally Displaced Persons (IDPs) were in the Northern regions of Gao, Kidal and Timbuktu, the most difficult ones to reach by emergency aid and the most unsafe.

Unlike many other similar situations of internal conflicts, IDPs do not gather in massive humanitarian camps, says Mr Keita from the FAO Mali.[12]

12. Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert

Figure 5. Burkina Faso Migration Balance by Region 2006



Source: Authors, Data Source: RGPH – Theme 8, 2006.

In the country, solidarity and networks are channels that are absorbing the flows of migrants: in southern cities such as Bamako or Ségou, families are hosting many of their relatives and former neighbors who are fleeing the conflict. In Bamako itself, only two small buildings owned by the Catholic Church and overcrowded, were converted to host IDPs. This absorption by local populations makes it extremely difficult to count and provide the migrants with humanitarian support. Local associations of migrants coming from the same city ("*associations de ressortissants*") are quite active in this process. Many families left one or two members in the North to look after the household house and fields. The division of the country temporarily disrupted the normal movements of population and distribution of food, seeds and other products between the two halves of the country.

Mr Keita is convinced that most of the IDPs are waiting for the end of the conflict and will eventually return home. Following the French intervention under the "Serval" Operation and the progressive pacification of the North, this return movement has slowly begun. Moreover, thanks to the "humanitarian corridor" established by the Islamist occupants and according to the national expert of the FAO interviewed, a massive hunger crisis in Northern Mali was avoided. The 2012 harvests were considered to be good ones, at sufficient levels (OCHA, 2013).

Meanwhile, Mali is facing a critical moment in terms of food security, with 10.3 million Malian people estimated to be food insecure and 1.4 million children at risk of severe malnutrition (UN Dashboard, 2013). The World Food Program is already assisting 200,000 people on a daily basis in Mali since the beginning of 2013, including 90,000 in the North.This situation is also particularly fragile for Malian refugees and Burkinabés in Oudalan and Soum provinces of the Sahel region in Burkina Faso, where large animal influxes are putting enormous pressure on areas still recovering from the 2012 Sahelian drought and the resulting Sahelian crisis. The UNHCR Burkina Faso office has issued an appeal for additional international aid, as refugees' living conditions are in some camps considerably below emergency standards – i.e. receiving less seven liters of water per day (UNHCR, 2012).

The Conflict in Northern Mali in 2012 has provoked the cross-border movements of thousands of displaced populations and refugees. The military battles/conflicts in January 2013, following the French intervention, triggered even more people to move away from their native region. In February 2013, the United Nations reported 177,000 refugees, mainly in Mauritania (75,000), Niger (54,000) and Burkina Faso (48,000) (UN Dashboard, 2013), provoking troubles for the host regions. In March 2013, according to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), more than 280,000 people were displaced within Mali because of the conflict. Almost 30 per cent of Internally Displaced Persons (IDPs) were in the Northern regions of Gao, Kidal and Timbuktu, the most difficult ones to reach by emergency aid and the most unsafe.

2.2. Burkina Faso's Permanent internal flows – Adaptation through Migration & Improved Farming

Increased climate variability as cause for more long term rural-rural migration

While Burkina Faso was still an emigration country between 1969 and 1973, internal rural-rural migration over short distances played a key role in survival strategies to the drought. Rural zones represented 41 per cent of destinations and 68 per cent of departures in 1969-73 (Coulibaly et. al., 1975), reflecting the difficulty for households to afford long-distance migration in times of scarcity. Unlike Mali, where most internal migrants ends up in cities, internal migration in Burkina Faso has remained strongly rural-rural, with 75.3 per cent of migrant settlement in rural zones in 1985 and 70.4 per cent in 1996 (Coulibaly et. al 1975).

While an increasingly variable climate has intensified households' dependence on extra-farm activity like seasonal migration (Peyraut, 2012), environmental migration is gradually becoming a permanent response (UNEP, 2011). Short-term

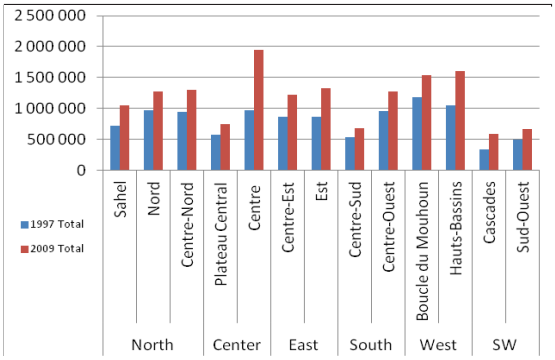
Supporting The Program, FAO Mali, March 29th, 2013

rainfall deficits tend to increase the risk of long-term migration to rural areas and decrease the likelihood of short-term moves to distant destinations (Henry, 2004).

Origin and Destination

As in Mali, a north-south trajectory describes Burkina's more permanent flows (Lindqvist, 1993). 61.8 per cent of long-term internal migration in Burkina Faso occurs between regions, the outflows stemming from the dry Central North, North, and the densely populated Central (Mossi) Plateau, (figure 6). Migrants are headed mainly to seek jobs in the capital Ouagadougou in the Center (35.7%). Comparable to Mali's industrious Ségou region that hosts the Office du Niger cotton administration, the cotton-producing zone in the western region of Haut-Bassins, home to the country's second biggest city, Bobo-Dioulasso, attracts 17.9% of these migrants (RGPH-Theme 8, 2006).

Figure 6. Burkina Burkina Faso population figures by region 1997-2009



Source: Authors, Data Source: INSD Online Database : http://www.insd.bf/fr/

Thieba (2003) characterizes the scarcely populated south-western regions as new recipients of migrants, particularly returnees from the Ivory Coast, since the unstable political climate and anti-foreigner sentiment in this country have diverted many seasonal Burkinabé workers towards the capital (Wouterse, 2008). Migration has lead to population growth in the 1980s-1990s in previously sparsely populated areas like the East and Central West.

Case Studies of the Lan, Bakaribougou, Tagou destination villages

Migrants in destination areas have been threatened by tenure insecurity and increasing demographic pressure. The 1984 RAF law, which had intended to allow agricultural land access to all citizens regardless of their origin (Mathieu et al, 2002), has been largely ignored by indigenous populations. Meanwhile, the rapid conversion of forests into farmland areas, which coincides with substantial land acquisitions by private investors encouraged by the government, have also increased pressures on migrants who now have to operate in a harsher tenure environment.

Field studies conducted by Pearson in 2012, in three villages in the southern, western, and eastern destination regions of Burkina Faso for migrants coming from northern and central provinces reveal the migration trajectories and coping strategies of migrants at their destinations (Pearson 2013).

Migration Trajectories : fieldwork conclusions

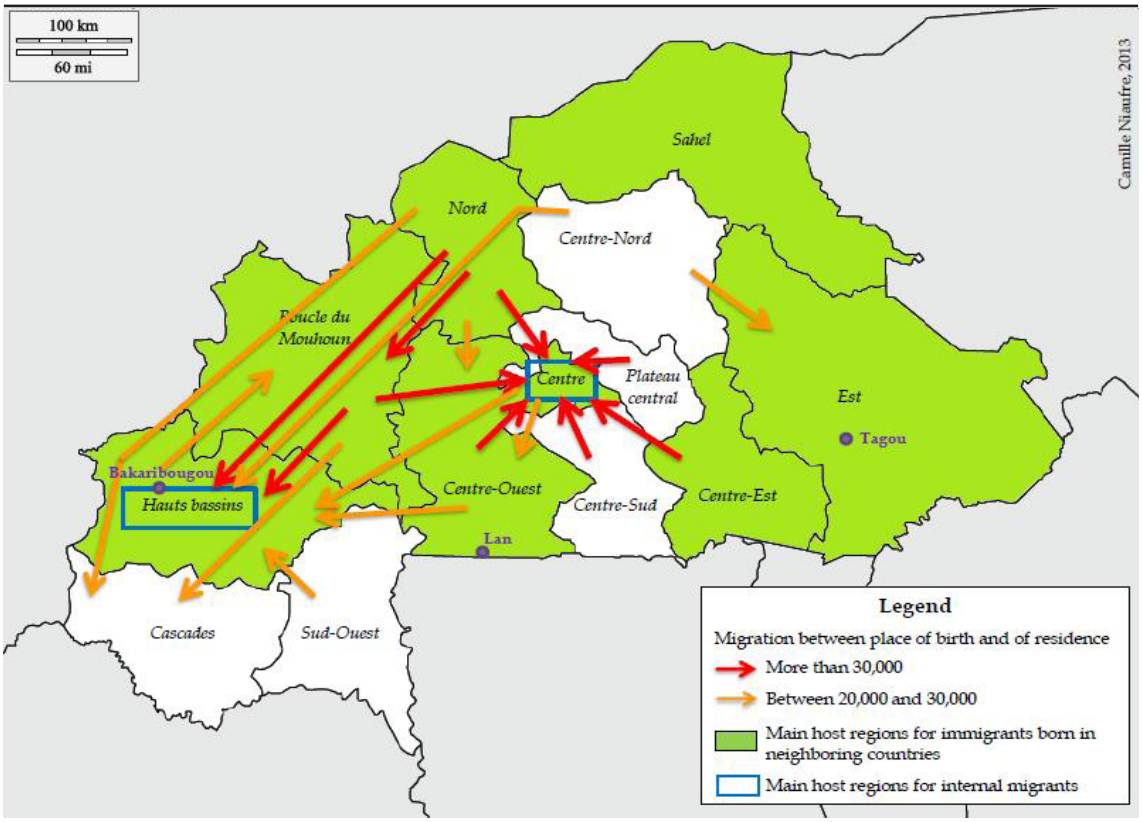
The studied villages of Bakaribougou, Lan, and Tagou, are diverse examples of host villages located in Burkina Faso's cotton basin in Haut Bassins, the fertile Central West region that began attracting migrants after the droughts in the early 1980s (Ouedraogo et.al 2011), and the East region, whose weak immigration rate allows for greater tenure availability for land-seeking migrants (RGPH-Monography of the East Region, 2006).

A host to large migrant flows since the 1960s, Haut Bassins is Burkina Faso's oldest agricultural colonization zone. However, the rate of migration to the region has since fallen as migrants are heading farther south to less densely populated areas like Comoé, Kénédougou, and Poni (Lignon, Leclère, undated). Migrants now often make up the majority of villages, while some have created new ones. With seven out of its eight hamlets comprised of migrants, Bakaribougou was created by returning migrants forced to work in Mali under the French colonizers (Pearson, 2013; PCD-AEPA 2010).

In contrast to the populous cotton region, a historically low population density (29.2 hbts/km^2) and abundant forest cover made the Central West region a preferred destination for herders and farmers fleeing the droughts in the North and Central-North (Ouedraogo et. al., 2010). Rapidly decreasing forest cover has led to many studies linking population growth to deforestation in the region (Ouedraogo et. al 2011). In 2006, migrants made up 25.7 per cent of Sissili Province, where Lan is located (RGPH-Theme 8, 2006). Now one of the most densely populated villages in the rural commune of Léo, Lan grew from 1,016 inhabitants in 1996 to 1,840 in 2006 (INSD Onsite Database, 2006), reflecting both natural increase and continued migrant flows.

Also characterized by low population density (26.2 hbts/km^2) and relatively abundant land, the east of Burkina Faso has a migrant population of only 4.8 per cent though this percentage has been steadily rising (RGPH-Monography of the East Region, 2006; INSD Online Database, 2013). Tagou,

Map 2. Distribution of the population by region of birth and area of residence in Burkina Faso, 2006



Source: Authors; Data Source: RGPH-Theme 8, 2006

located in Gourma Province, whose population comprises of 13 per cent migrants, has attracted much of this flow. Its population – 3,006 in 2006 -- constituted 11 per cent Fulani migrants, and 54 per cent Mossi migrants, compared to the native Gourmantché population (26%) (RGPH-INSD Onsite Database, 2013).

Situation in the villages

A north-south step pattern of migration due to land scarcity in traditional destinations

For many study respondents, their current villages were not the first place they had settled. In Lan, migrants had moved in a north-south step pattern, forced out of more populous communes like Koudougou (237 hbts/km²) (RGPH-Monography of the Central West Region, 2006) to areas further south. This pattern is also reflected in the intra-provincial southward movements within the East region, with migrants leaving heavily populated Gnagna province to settle in Gourma, from where farmers emigrate south to Kompienga (RGPH-Monography of the East Region, 2006).

In all three villages, the Fulanis were the latest to arrive, with average settlement duration of 21.9 years compared to 34.5 years for Mossis and 39 years for Samos. In Lan, Miriam Barry's family of herders had stayed 12 years in Sapouy, an area further North in the province, but faced difficulties when attempting to sedentarise. Souleman Barry's family spent 27 years in Koudougou in Northern Sissili, before heading to Zoro, where they spent 39 years before moving even further south to Lan 14 years earlier, largely because of declining pastoral space for their animals (Pearson 2013). These observations suggest the need for improved policies to protect migrant pastoralists and to improve their integration as farmland expansion increases in destination areas.

Tenure insecurity

Despite habitual tensions over crop damage caused by Fulani animals, or field expansion, and a fragile hierarchical relationship between the migrant *étranger domicilié* and the local *tuteur,*[13]

13. Only local villagers belonging to the patrimonial lineage of the village (tuteurs) have access to tenure rights, and are allowed to delegate them to foreigners ("étrangers domiciliés"), who in their turn are expected to demonstrate their willingness to integrate in the village by various forms of social commitments. See more in Hochet, Peter, Saïdou, Sanou, 2012. « Reconnaissance des droits fonciers locaux Enjeux opérationnels de l établissement

fieldwork was part of a larger spirit of cooperation, in which migrants were included in village decision-making.

Located in the densely populated region (82.6 hbts/ km²) of Haut Bassins, Bakaribougou has undergone a widespread monetization of land rights with most migrants renting their land for 15,000 CFA under an annually renewable contract (Pearson, 2013). However, such land practices theoretically allow locals to reclaim land when they need it, by not renewing contracts, or exchanging good land for marginal land, a process that may intensify inequality between migrants and locals.

Moussa Drabo, a migrant farmer in Bakaribougou interviewed during Pearson's field studies, explained:

> *"Before, during my father's time, you could access land by offering a sacrifice of a chicken. Now it's money that makes things turn. No money. No field. Before, [land] was free. […] Each year, you must [now] work in the owner's field if you can't pay the 15,000 CFA. You could cultivate one ha of the proprietor's land yourself, and one ha of the tutor's land" (Ibid).*

Tenure insecurity may have indirectly lead to longer land use especially among migrants, though this has often come with intensification efforts through the use of manure and SWC techniques, as migrants fear the loss of rights to land re-inserted into the bush for fallow.

Limits to migration: Scarcity leads to adaptation

Such efforts to adapt by increasing yields in a drying South-western climate is linked to a sense of scarcity in the mind of migrant farmer, Adama Sawadogo, another study respondent:

> *"Because of the growth of the population, the cultivatable surface of the land is insufficient. I don't blame the locals. Now we have to give back our land. We're scared of no longer having any land. But if we lack land, we have to adapt. The problem [of scarce land resources] is everywhere. We can use the manure technique to improve the land. We can't run anymore; there is no more land" (Ibid).*

Adama's account displays a more nuanced understanding of population pressure and the ability to contextualize the behavior of local actors even when such actions negatively affect him (Ouedraogo et.al., 2010; Benoit, 1982). De Zeeuw's (1997) observations of the high value placed on peaceful social relationships in western Burkina Faso helps us to frame the cultural values at work in village structures of authority.

Table 2. Average Total Soil & Water Conservation (SWC) Techniques Practiced per Household in the Three Destination Villages

	Locals			Migrants			
	Sissala	Bolons	Native Gourmantché	Fulanis	Samos	Mossis	Migrant Gourmantché
Lan	4.6*			3.8		7.4	
Bakaribougou		9		5.3	9.2	18.5	
Tagou			7.2	12.3		15	6.7
Average	4.6	9	7.2	7.1	9.2	13.6	6.7

Source: Authors; Data Source: Pearson, 2013

*Numbers based on survey responses from 90 farmers in the three villages. SWC techniques were based on CILSS documents on "Bonnes Pratiques" and informant interviews with extension agents as well as farmers. Techniques do not include synthetic fertilizers or pesticides.

In general, study results show that migrants tend to be more tenacious farmers. Mossis, who are particularly perceived by locals in all three villages as problematic due to their aggressive land-clearing and rapidly expanding populations, engage in the greatest variety of SWC techniques introduced by the extension services. An agent at the Provincial Agricultural Service in Lan said that Mossis were 'innovative': "They come from far to search for their livelihoods…. The natives are born here so they're not worried about the competition." The village's *Parcelle Vitrine de Producteur*, an experimental farming plot to demonstrate good practices, is owned by a Mossi migrant farmer. Indeed, similar results were found by Gray and Kevane (2001) who showed how income levels improve the likelihood of SWC investment, a way to secure land rights in Haut Bassins.

In the absence of robust national adaptation policies, populations in both Mali and Burkina Faso are continuously applying autonomous insights to adapt to an increasingly volatile Sahelian climate. Farmers continue to move in search of fertile areas abundant in land and better livelihood opportunities, creating new routes where old ones have become congested, and adapting to their new environments where fewer resources demand better land management and cooperation. National policies have to some extent supported these grassroots responses, though there remains work to be done.

des accords de prêt prévus par la loi burkinabè portant régime foncier rural N°16 », GRN Notes, GRET website.

3. POLICY RESPONSES AND THEIR INSUFFICIENCIES

Burkina Faso and Mali have taken many steps at the international and regional levels to protect their migrants on the one hand and to deal with environmental transformations on the other. But despite efforts to take into account the environmental cause for migration, they fail to bring an integrated response to this multidisciplinary issue.

3.1. International legal responses to displacement

Labor migration and development

Given the importance of labor migration to income diversification in the environmentally unstable Sahel, the ratification approach to international and legal frameworks is clearly dedicated to the protection of labor migrants and to endorse migration as a development strategy.

Ratified by both Burkina Faso and Mali in 2003, the 1990 UN General Assembly of the Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (entered into force in July 2003), while not specifically identifying cross-border migration as an adaptive strategy, does define rights for international seasonal workers (Article 59).

Focusing further on facilitating intra-regional migration, the 1979 Economic Community of West African States (ECOWAS) Protocol Relating to Free Movement of Persons, Residence and Establishment is a particularly relevant instrument in an area where seasonal cross-border is of greater scope than long-distance international migration.

The EU-African migration policy partnerships foster migration as a development strategy to reduce intercontinental flows. The Migration for Development in Africa (MIDA) programme, launched by the IOM and endorsed by the African Union (AU) in 2001, aims at encouraging African nationals and highly qualified professionals to directly contribute to the development of their countries of origin, combating brain drain. Along the same lines, the ILO and NEPAD launch of the 2002 "Africa Labor Migration Policy Initiative" assists African countries in developing local labor migration frameworks. Additionally, the AU Common Position on Migration and Development and its Strategic Migration Policy Framework, adopted in 2001.

IDPs and Refugees

On the crucial topic of internal displacement, both Mali and Burkina Faso signed and ratified the 2009 AU Convention for the Protection and Assistance of Internally Displaced Persons in Africa. Also known as the Kampala Convention, this mechanism identifies the environment as a cause for forced displacement, but only in the case of "*natural disasters*", without much attention dedicated to slow onset events[14].

Finally, both Mali and Burkina Faso ratified the 1951 United Nations Convention relating to the Status of Refugees and the 1969 Organization for African Unity (OAU) Convention governing the specific aspects of refugee problems in Africa. Neither policy instrument explicitly states the environment as a cause for the forced crossing of international borders.

3.2. Protecting the environment and enhancing agricultural resilience

There is no evidence that national authorities recognize the growing desertification as a direct "push factor" for migration, whether permanent or seasonal. However, they acknowledge that this phenomenon is a threat for development and food security of rural areas and implement policies through National Plans to prevent it, in the framework of the 1994 United Nations Convention to Combat Desertification (UNCCD Mali, 2004; UNCCD Burkina Faso, 2004).

Measures to combat drought effects on food security through scientific research have been substantially influenced by the creation of the Club du Sahel/CILSS (*Permanent Interstate Committee for Drought Control in the Sahel)* partnership in 1973 that, despite its shortcomings, has helped to draw attention to agriculture and ecological issues, increase aid flows, and improve dialogue on development assistance in the region (OTA, 1986). While CILSS has found it difficult to infiltrate government policy, the organization's Director of Natural Resources Management (NRM), Edwige Botoni, has said that both Mali and Burkina Faso have actively engaged in efforts to improve agriculture to better adapt to climate change (Interview-in-Person, 2012).

Both countries are also rather active in the implementation of the 1992 United Nations Framework Convention on Climate Change (UNFCCC),

14. In article 4.2 of the Convention, States commits to prevent internal displacement related to environment issues by "*devis[ing] early warning systems, in the context of the continental early warning system, in areas of potential displacement, establish[ing] and implement[ing] disaster risk reduction strategies, emergency and disaster preparedness and management measures and, where necessary, provid[ing] immediate protection and assistance to internally displaced persons.*"

with several reports published since the 2000s, detailing the sources of greenhouse gas emissions (GHGs) and how to mitigate them. Given that Mali and Burkina Faso contribute very little to global GHGs, the reports focus on adaptation strategies rather than mitigation. The link between climate change impacts and environmental migrations is not explicitly referred to neither does it appear clearly in the targets of the actions implemented (UNFCCC Mali, 2000, 2011; UNFCCC Burkina Faso, 2001).

In 2007, Mali and Burkina Faso presented their National Adaptation Programmes of Action (NAPAs) in the framework of the implementation of the UNFCCC. The primary objective of these NAPAs is to identify a set of priority projects[15] to cope with the most urgent dangers of climate change. Developing the agro-pastoral sector, protecting crops and cattle, and promoting food security are among the top five priorities for both countries. None of the reports quote migration triggered by environmental changes as a long-term policy adaptation strategy. It is only briefly mentioned in the Burkina Faso NAPA as an endogenous practice to cope with a deteriorating environment (NAPA Burkina Faso, 2007).

3.3. The insufficient management of rural development and seasonal migration

Enhancing the development of rural regions: an indirect tool against migration?

The answer largely proposed to mitigate environmental pressures is the development of rural regions and poverty reduction through improved infrastructure and local job opportunities. This is clearly aimed at reducing rural exodus for economic reasons.

The 1989 Bandiagara PRBP project in Mali (rehabilitation of dykes, dams and roads) has enabled the opening up of many isolated Dogon villages and the development of local small businesses, with the reduction of permanent migration as one of its declared objectives. The results, according to the 2003 Impact Report, are ambivalent: on the one hand, the new resources enabled young people to finance their trip to the cities; on the other hand, the return rate of seasonal migrants is higher since the development of the region (Sieveking, 2009).

Across the border, in Burkina Faso, the National Programme against Desertification (PAN/LCD, 1986), the Programme for Improvement of Living Conditions (PC-ACV, 1991), and the National Environmental Action Plan all tout the development of infrastructure and public services as a way to retain migrants (Beauchemin, 2005). While Burkina Faso's Poverty Reduction Strategy mentions the role of migration and/diasporas in stimulating trade, it fails to report any net gain in human capital as a result of migration (Black, 2009), promoting instead job creation and rural road construction (Beauchemin, 2005).

Furthermore, agricultural intensification is one of the main lines of action to develop rural areas and ensure food security in the long term (FAO Mali Interview, 2013), and prevent north-south migration flows. A 2005 Report by the Malian Ministry of Agriculture champions improved agricultural mechanization as a means to improve the countries agricultural production system for which only 35 per cent of the "Agriculture Production Units" in the central zones of Sikasso and Ségou are equipped with elementary material such as animal-towed ploughs.

Likewise, access to ploughs in Burkina Faso was made available by government programs aimed at increasing the production of cotton (Ouedraogo et. al., 2010), while the promotion of 'agribusinessmen stakeholders' by the government to invest in large, mechanized farms (50-400 ha), has been touted as a means to improve food security (Ouedraogo, 2002). Investing generously in agriculture, the government plans to increase sorghum and maize yields by 322 per cent and 187 per cent respectively by 2015 (AGRA, 2013).

Adaptation in Burkina Faso: examples of state-led resettlement, improved farming and rural development strategies

Conceptualized in the aftermath of the severe Sahelian droughts of 1970-72, the Volta Valley Development (AVV) program was primarily an attempt to resettle families from the densely populated Mossi Plateau to repopulate the valleys of the three Volta rivers that had been ravaged by the onchocercose cattle epidemic in the 1960s (FAO, 1987). While the state initially failed to relocate the desired populations due to high costs and unresolved tenure tensions between migrants and locals, these newly developed areas would eventually attract spontaneous migrants fleeing the droughts in the 1980s (Thieba, 2003). Migrants were responding to what Henry (2004) analyses as interconnected economic and environmental factors, whereby natural resources were economically valorized (cash crops), and development initiatives such as hydroagricultural installations and production systems were organized in destination areas. Such areas around the

15. 19 in the case of Mali, 12 in Burkina Faso.

Kompienga and the Bagré barrages have since become centers of diversified activities resulting from new farming hamlets, the development of horticulture, tree plantations, etc (Marchal, Quesnel 1996).

The importance of natural resource management in Burkina Faso's climate adaptation policy approach, spurred by SWC campaigns led by NGOs and foreign donors since the 1970s (Kondé, 2011), is reflected in its numerous national plans and programs such as the National Biodiversity Strategy (1999), the National Action Plan to Combat Desertification (1999), the National Action Plan for Integrated Management of Water Resources (2003), and the Environmental Plan for Sustainable Development (PEDD-2002). SWC campaigns have lead to at least 200,000 ha of rehabilitated land (CILSS 2009), while crop yields increased by 63-74 per cent in fields treated with rock bunds and zaï (Sawadogo 2011).

Although such scientific studies have been nationalized under the Institute of the Environment and Agricultural Research (INERA), R&D in Burkina Faso largely depends on financing from international donors like the World Bank, and fluctuations in funding since 2004 have raised sustainability issues (Stads et. al. 2010).

While development of rural areas and improved farming techniques are perceived as better adaptation policies, migration is recognized as one of the principle risks of natural disasters in the country's national platform for the Hyogo Framework for Action - the National Council of Emergency Relief and Recovery (CONASUR, 2009; UNISDR, 2013). Moreover, the PAN/LCD (1999), which classifies migration as a survival and livelihood diversification strategy, focuses on the need to control migration which it links to environmental degradation in destination areas.

Mali: accompanying seasonal migration

As previously analyzed, migration is part of a regular livelihood strategy for many rural populations through seasonal mobility between rural and urban areas. This cycle is well known by the authorities, which try to better accommodate it. When the rainy season approaches, national media broadcast messages in the cities to encourage the migrants' return to the countryside and support the farmers' efforts in the fields. This campaign appears relatively efficient: during the harvesting period, there is sometimes a lack of houseboys and housemaids in the cities, positions that are commonly occupied by temporary rural migrants.[16]

However, most of these movements escape the attention of national authorities and rely only on individual efforts, networks and solidarity. For example, after the last rain of the season, many young women leave their village as a group, are then accommodated by a host family in town and come back together after the dry season. This system also puts pressure on each member of the group to return to the village at the same time as the others.[17]

Despite these solidarity links and the support of seasonal migrant networks, living in the cities as housemaids and houseboys[18] can be highly dangerous, and the youth often experience abuses from their employers or new neighbors[19]. There is a clear lack of national policy to protect seasonal migrants: national authorities do not clearly recognize the social and financial insecurity for often very young migrants.

There is some evidence of rural communities attempting to regulate the migration of their own population, acting on behalf of the national government. According to Sieveking's (2009) study on the very dry and isolated Bandiagara region, local authorities, worried about the development of female migration and its more and more permanent characteristic, adopted rules, whether financial or social, sanctioning any woman migrating without prior authorization from their father or husband.

In conclusion, the current national and international policy framework adopted by both Mali and Burkina Faso provide some level of protection for migrants abroad, but internal migrants, who constitute most of the environmentally-induced flows, remain vulnerable. While policy efforts promote rural development and agricultural resilience to climate change, little is done to integrate migration into this formula of adaptation.

16. Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

17. Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

18. Some rural young men for example travel everyday outside of Bamako, pick up hay and plants, come back to the city and sell their findings to local livestock farmers for very little money (Konaté, 2013).

19. For instance, the sexual abuse of under-aged girls who may end up getting pregnant or ill during their time in the cities sometimes prevents them from returning to their village at the next rainy season, partly out of shame. Also, recovering their salary is often extremely difficult, as employers may take advantage of their youth and inexperience (Dembélé, 2013).

3.4. Coping with environmental migrations in the Sahel region: Policy Recommendations

The first challenge emerging from the policies' assessment conducted in this article is the lack of legal protection for migrants facing the specific challenges of an environmentally and socioeconomically fragile Sahel. The insecurity derived from farmland expansion in destination areas in southern Burkina Faso calls for improved policies to protect migrant pastoralists. Likewise, in Mali, policy instruments must be applied to protect seasonal migrants and to reinforce support networks in cities. The few steps taken to protect IDPs are encouraging, but they make no reference to slow-onset events like desertification as a cause for displacement; moreover, they need to be integrated in national policies in order to provide concrete protection on the field for Burkinabé and Malian citizens.

In both countries, most environmental migrants remain within national borders and are thus not covered by international frameworks protecting labor migrants and refugees. Furthermore, though instruments like the ECOWAS Protocol provide frameworks to foster regional migration, which may in turn help to relieve population pressures in countries of poor climate and few natural resources like Burkina Faso and Mali, systematic denial of rights and expulsion of foreign workers in key countries like the Ivory Coast demonstrate how such policy instruments are often at the whims of national politics (Black et.al 2004). While such regional mechanisms should be improved and expanded to uphold permanent residence rights and to protect environmental migrants, national policies must first address internal migration, as this has been the most common trend of environmentally-induced migration in both countries.

Simply considering environmental migration a problem to be fought is counterproductive. Its integration, for example, in NAPAs is essential to better understand the phenomenon particularly in the context of more voluntary, slow-onset events. Issues related to permanent internal migration such as tenure security in destination areas must remain a priority for governments in a way that incorporates decentralization and participatory processes involving both migrant and local decision making and customary consideration. Policies must be equally accompanied by effective legal support and the upholding of property rights, whether this involves property titles[20], monetarised tenure, or temporary contracts.

The emphasis placed on the regulation of internal mobility, rather than on the promotion of flows, can be understood by the lack of governments' capacities and funds to support urban population growth. Additionally, the desertion of poor rural areas is not a long-term solution to fighting climate change or reducing adversities linked to it. Both local and migrant populations have a major role to play in the sustainable management of resources and to stop the advancing desert. Furthermore, the studies we have cited show that an unchecked rural exodus can simply shift environmental degradation from origin to destination areas.

Yet, examples from Burkina's AVV program have demonstrated that development of rural areas has indirectly facilitated permanent rural-rural migration, relieving population pressures on environmentally stressed areas. Field observations show how newfound scarcity in rural destinations has spurred the cooperation and exchange of improved farming techniques between local and migrant communities (Pearson, 2013). These efforts could be better applied if the potential role of environmental migration in climate change was better studied and more integrated into adaptation policy. With their use of sustainable strategies (supported by the State) to increase productivity, environmental migrants appear less as an ecological burden and more as a potential solution in reducing risks and vulnerabilities to climate change.

CONCLUSION

Evidence from both Mali and Burkina Faso points out that the migration in response to environmental problems is almost never entirely forced or voluntary, but rather a gradual response to environmental changes that alter the capacity to response.

An even more intense version of this phenomenon is occurring today with the recurring Sahelian environmental crises of 2005, 2008, 2010, and 2012 continuing to weaken the coping capacity of highly vulnerable populations (FAO, 2013). Furthermore, the flight of 170,000 Malian conflict refugees in recent months has substantially disrupted farming activities in the drought-sensitive and migrant-senders Provinces of Timbuktu, Gao, and Kidal. Moreover, the settlement of these migrants in neighboring countries has exacerbated local vulnerabilities in Northern Burkina.

20. See for example Maitre Abdoulaye Harrissou's *Simplified Secure Title*, an innovative instrument to provide land security to African populations (Heard at the conference "*Access to land in Sub-saharan Africa, key to development*", on June 24, 2013, at Ifri, Paris)

Less media-grabbing examples of drought-induced migration in Burkina Faso has shown similar impacts of migration on scarcity in traditional destination regions. However, the "population-degradation" (Kevane, Gray, 2001) paradigm is nuanced by examples of innovation and investments in sustainable agricultural among both migrants and local farmers in the face of resource scarcity, which point further to the need to protect vulnerable groups such as women and the poor.

Indeed, it is here where the nexus of mitigation and adaptation form a continuum. Whereas, the UN Special Reporteur for the Right to Food, Olivier de Schutter, advocates agro-ecological farming methods that are better equipped to absorb expected climate shocks (De Schutter, 2010), better managed remittances from seasonal and permanent migration may be key funding sources for scaling up such farming methods and building up resilience. Furthermore, Pretty et. al's (2011) study show links between the implementation of SWC practices and decreased rural exodus as young men choose to become day laborers on degraded land owned by farmers rather than migrate. More efforts should be made to measure the linkages between the migration and other efforts to build resilience against climate change and how such strategies may be mutually reinforcing.

While the FAO responses to the crisis has attempted to minimize migration, which it perceives to be a negative mechanism of adaptation (FAO, 2012), Mr. Modibo Touré of FAO Mali offers that permanent migrations, especially international movements, are also positive as they allow for numerous resources that would otherwise not be generated to pay for seeds and farming inputs.[21] Moreover, if migration is to be seriously considered in policy responses to environmental degradation and food security in the region, care must be taken to coordinate the linkages between migration, survival, mitigation, and adaptation, but at the same time involving rural communities in the planning process in order to help populations build resilience against an ever-evolving climate.

21. Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

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IN FOCUS

2012 Floods in Bangladesh and food insecurity

Emily Ferguson

On average, one-third of the country is flooded during the monsoon season, becoming a common fact of life in Bangladesh. However, due to the importance of the agricultural sector in the country and its sensitivity to environmental disruptions, ensuring food security -- both in the aftermath of a disaster and in the long run -- is a critical issue for the country. The great level of poverty in Bangladesh, which currently stands at 40 per cent of the total population, further exacerbates the threat to food security (GoB, 2010).

Floods and food insecurity

On the 25th and 26th, June 2012, the Chittagong division faced 65 cm of rainfall, one of the highest recorded rainfalls in the last two decades. The rain lasted for a month, inducing flash floods, and major rivers flooding. The conjunction of those events explains the severity of the damages. Despite under-coverage by local media, this was the worst flood and landslide to have hit the Chittagong region in the last 60 years (WASH, Shelter and Early Recovery Cluster & GoB, 2012). Official estimates found that 1,700 acres of crops had washed away; entire villages were submerged; and more than 200 mud roads had been destroyed. As the affected regions struggled to recover from the floods, thousands of people were left food insecure. Poultry farms and fish hatcheries were also severely affected, both of which are important sources of protein in the Bangladeshi diet (Ibid.).

Food security is threatened by natural disasters as these events cause food prices to increase and incomes to decrease, which heightens a household's vulnerability to future crises that threaten food security (del Ninno et al., 2001). Improving the level of food security remains a key development goal for the country.

Understanding food insecurity in Bangladesh

Under normal conditions, more than two-thirds of the rural poor face food insecurity during the lean (*monga*) season before the rice harvest, which occurs in September/October as well as in March/April. Other contributing factors to food insecurity include a large and growing population, lack of assets, debt, social exclusion, low job opportunities, marginalization, and of course, natural disasters (ACF, 2013). In urban areas, food insecurity is mainly determined by unemployment or under-employment, and a lack of marketable skills due to low levels of education (Ibid.).

Food security is not only about production stocks, but also about the future food requirements, level of income and commodity prices (Yu et al., 2010). Currently, the major challenge for the country is to keep up with the food demands of a fast-growing population (1.3% growth rate) with increasing incomes. On average, the dietary diversity is quite low; in 2008, the Bangladesh Institute of Development Studies (BIDS) reports that a full 76 percent of calories come from cereals (mainly rice), with the remaining 17 percent coming from other plant and animal sources (primarily fish) (Rizvi, 2013).

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DROUGHT AND INTERNAL DISPLACEMENTS OF PASTORALISTS IN NORTHERN KENYA IN 2012: AN ASSESSMENT

PIERRE BONNEAU

INTRODUCTION

In March 2012, the county of Isiolo was crippled by inter-ethnic clashes among Borana, Turkana and Somali pastoralists that triggered displacement of approximately 5,000 Turkana pastoralists. Reasons behind the conflict were a complex mix of political and economic tensions in addition to competition over access to natural resources (grazing lands and water), accentuated by recent migration flows of pastoralists from drought-affected areas. To quell the violence, the provincial administration ordered the pastoralists from neighbouring county of Wajir and Mandera who had recently arrived in Isiolo to return to their areas of origin, where pasture had replenished (IRIN, 2012b).

This event encapsulates the complexity of drought-related pastoralist displacement in Northern Kenya. Droughts trigger urban migration flows of pastoralists, using displacement as a coping strategy. The arrival of new comers to existing communities can reignite long-standing disagreements and conflicts over use of natural resources with other communities. Furthermore, local politicians exploit latent and long-standing community hostilities to fuel conflicts to affect voting patterns and win office. Theses overlapping environmental, economic and political conditions lead to deaths and displacement of pastoralist communities.

The pastoralist lifestyle relies on livestock production in arid and semi-arid land through extensive mobility patterns and use of natural forage and water points. As such, it is intrinsically linked with mobility and migration and in the popular perception of pastoralism, speaking of pastoralists' displacement would be tautological. Contrary to this perception, a report of IDMC and ISS (Sheekh et al., 2012) concluded that as of the end of 2011 there were over 400,000 pastoralists that could be considered as internally displaced persons[1]. Factors underpinning pastoralists internal displacement were seen as very diverse and often multicausal, according to the report. The report mainly focused on issues of displacement related to conflict – the biggest issue in Kenya. Climatic triggers of displacement such as drought were not addressed in depth. Nevertheless, issues of drought and resource depletion in northern Kenya are of utter importance and are connected, to some extent, with flows of displacement—as the Isiolo conflict shows. Indeed, there are many connections between the conflicts in the Northern regions of Kenya and stress factors linked to droughts, including resource depletion of pasture and water, livestock loss.

The chapter assesses therefore drought-related internal displacements of pastoralists in northern Kenya as of 2012 and questions to what extent droughts may be direct and indirect major factor for displacement. It interrogates the responses at the national and international level and presents the challenges and gaps to be addressed. The object of study is complex as it focuses on different categories of pastoralist displacement, from flows of pastoralists displaced in 2012 to communities of pastoralists that can still be considered in a state of protracted displacement as of 2012.[2]

1. According to the UN Guidelines on Internally Displaced Persons, internally displaced persons are "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 in order 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." (UN, 1998)
2. Secondary sources of information along with grey literature (media reports, articles, humanitarian reports) have been used for this paper.

It describes firstly how drought in context in northern Kenya contributes, along with other factors, to the slow-onset erosion of pastoralist livelihood systems. It assesses secondly the situation of drought-related pastoralists' internal displacement in 2012, by proposing a qualitative typology and some elements of quantification. It will then analyses the attention and assistance given at the national and international level, focusing on the policies targeting IDPs, disaster-risk reduction, development of ASALs and security. Finally, it will conclude and propose recommendations for a better understanding of drought-related migration and displacement flows within existing policy frameworks.

1. DROUGHTS IN KENYA: BETWEEN SUDDEN DISASTER AND SLOW-ONSET EROSION OF PASTORALIST LIVELIHOOD SYSTEMS

1.1. Pastoralism in Arid and Semi-Arid Lands northern Kenya regions

As presented in the introduction, this article focuses on the northern arid and semi-arid lands districts of Kenya that are home to most of the pastoralists in Kenya, represented in the map below.

ASALs cover about 80 per cent of Kenya's landmass and support about one-third of the country's human population and 70 per cent of the national livestock herd. The economy of the arid districts is marked by pastoralism, while the better-watered semi-arid district features more diversified sources of income, such as agro-pastoralism, mixed farming and rain-fed agriculture (Fitzgibbon, 2012).

Arid and semi-arid districts feature a very low level of development and a very high level of poverty. Poverty rates in arid provinces are approximately 51 per cent in 2009, whereas the national average is of 29.1 per cent (Fitzgibbon, 2012). In the northern districts of Marsabit, Turkana, Wajir and Mandera, between 74 per cent and 97 per cent of the population live below the absolute poverty line (Government of Kenya, 2009). Decades of political and economic marginalization have contributed to this low level of development. Infrastructure, facilities and basic services are weakly developed: access to water is problematic, the road network is poor, health facilities are unevenly distributed and only one district – Isiolo – is connected to the national electricity grid. Only 42.3 per cent of students in the north completed their primary school cycle in 2007, compared with 81 per cent nationally (Fitzgibbon, 2012). The populations of the northern areas are also extremely vulnerable to food insecurity: as of 2012 all the northern areas were classified as stressed or in crisis in terms of food security (USAID, 2012).

This poor level of development relates to a highly insecure context. State security services lack any meaningful presence in the regions. Since the 1990s, firearms have proliferated in the region. Inter-communal conflicts are frequent in these districts, killing 412 people in 2012 (OCHA, 2012b). They are often based on long-standing, resource-based issues (grazing rights, access to water and land), ethnic and/or political hostilities. The practice of cattle raiding, traditionally used in a rather non-violent way to capture livestock,[3] has become more violent in the last decade because of the previously mentioned factors, as well as the increased possibility of commercialization of the stolen livestock (Sheekh et al., 2012; Kaimba et al. 2011).

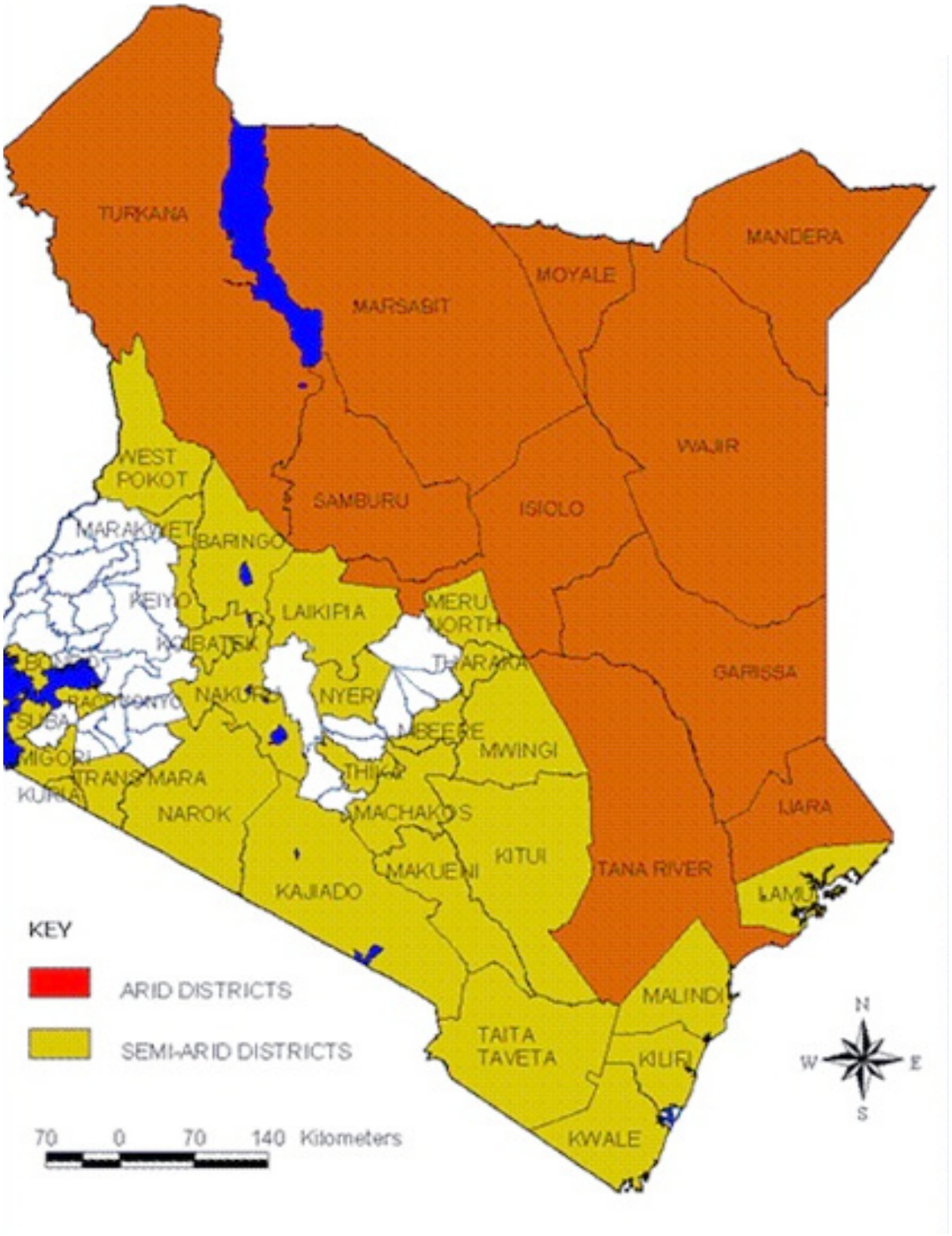
The term "pastoralism" covers a wide variety of societies, cultures, livelihood strategies, mobility patterns and geographic repartition. Their common feature is to rely in majority, on livestock (cattle, sheep, goats and camels) for food and income, and on natural sources of forage.

In Kenya, "census surveys of pastoralists are considered inaccurate and available data on pastoralism are largely inconsistent and unreliable, even though their regional presence is significant: it is believed pastoralists occupy 72 per cent of the national land mass in Kenya" (Sheekh et al., 2012). Pastoralism contributes to around 10 per cent and 12 per cent to the country's gross domestic product (GDP), with the livestock sector providing an estimated 90 per cent of all employment opportunities and more than 95 per cent of household incomes in ASALs (Schilling et al., 2012). Those statistics might not even reflect the total economic value of indirect benefits of pastoralism to the country (IIED, 2009).

The single term "pastoralist" is misleading: pastoralists are not a single homogeneous group. Their mobility patterns differ, from wholly mobile to semi-nomadic with seasonal migration (transhumant) or nearly sedentary with short-term and closed migrations. Far from being unchanging, pastoralist lifestyles are also evolving at a rapid pace through increasing diversification and education. Many pastoralists rely on other economic activities such as crop cultivation (agro-pastoralism, predominantly in semi-arid districts in Kenya)

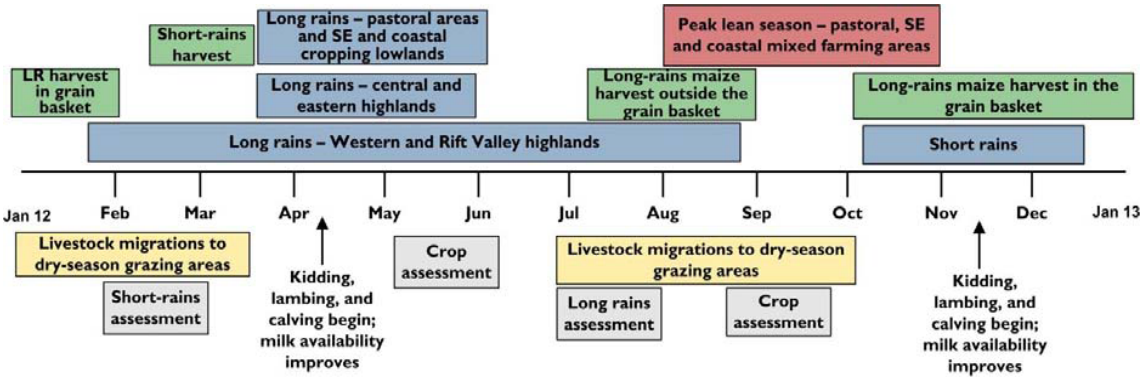
3. In order to restock, assert domination on a territory, acquire honour, pay the dowry for a marriage, or other cultural reasons.

Map 1. The Arid and Semi-Arid Land Districts in Kenya



Source: Arid Land Resource Management Project

Figure 1. Seasonal calendar and critical events timeline



Source: FEWSNET, 2012

or petty trade (Fitzgibbon, 2012). Also, because of education many children are attending sedentary schools while other parts of the family, mostly men, are migrating seasonally with the herds. The role of women, previously in charge of the domestic chores and of childcare, is also changing towards more involvement in diversification labour through urban migration (IRIN, 2012a). Pastoralists populations are also characterized by important inequality of wealth and assets.[4]

1.2 Droughts and vulnerability of pastoralists: repeated shocks and erosion of livelihood systems

Importance and impact of drought in northern Kenya

ASALs areas in Kenya are characterized by low and irregular rainfall (200mm to 500mm annually) as well as periodic droughts. The pastoralist lifestyle is supposed to be adapted to drought by relying on extensive mobility to access pastureland and water sources. However, for the past decades, droughts have had increasing impacts on population. Indeed, in 1975 approximately 16,000 persons were reported as affected by drought and requiring food aid. Two decades years later in 1999-2001 this figure reached 4.4 million, and an estimated 3.5 million during 2004-2006 (OHCHR, 2012). The 2011 drought was one of the most severe in 60 years to impact the Horn of Africa. The impacts were multi-faceted. Because of reduced availability of water source and of pasture land, livestock deaths and/or diseases were widespread. Crop failure, resource depletion, rising food prices, decreasing livestock prices and health and patchy livestock buy-back programmes (IRIN, 2011b) led to a loss of livestock, a loss of purchasing power and hence to food insecurity vulnerability of approximately 3.75 million people (OHCHR, 2012; IRIN, 2011b).

Adverse extreme environmental events affected different parts of northern Kenya in 2012. Certain areas of Kenya where affected by an early drought prompted by erratic and short rainfalls.

In July 2012, parts of the north-eastern Kenya, especially Wajir, were reported to suffer early drought because the March-April-May (long-rain season) rainfalls were delayed and "at a depressed volume, erratic, and unevenly distributed across the northern, northeastern and southeastern pastoral areas" (FEWSNET, 2012). Water reservoirs only received up to 10 per cent of expected levels, and pasture resources were depleted. The drought especially affected northern and north-eastern districts Turkana, Wajir, Marsabit, Mandera, Moyale, Tana River, where 2.4 million people were considered as food insecure, either in "Stressed" or in "Crisis" situations (FEWSNET, 2012). This early droughts triggered concerned of humanitarian actors that populations strongly affected by drought of 2011 were likely to fall again into a food-security emergency. Indeed, most of the food insecure population in 2012 consisted of pastoralists that were already strongly affected by the droughts of 2011 – if not before — and who had not fully recovered (KRCS, 2012). Hence, drought, it is very acute form, can be classified as a sudden-onset event, although it should not shadow the gradual erosion of livelihood systems of pastoralists.

Droughts as an external livelihood shock and the erosion of traditional coping strategies

Over the last decade, droughts have been perceived as hotter and drier than before and it has been attributed to climate change, even though there are uncertainties on the causality (IRIN, 2011d). But drought in itself is not the main problem because for centuries pastoralists have developed coping

4. Interview with Justin Ginetti, IDMC, 4 April 2013

strategies to survive in naturally arid environments. Drought becomes a problem when coupled to the vicious circle of vulnerability and poverty of pastoralists in northern Kenya, demographic pressure, the erosion of traditional livelihoods, the absence of service provision, political marginalization, and the already significant food and human insecurity (Overseas Development Institute, 2009). Indeed, the drought starts a chain of events that can result in changing mobility patterns, overgrazing, resource depletion, livestock disease and death and destitution of communities. This mix of factors may contribute to forced or obliged migration flows of pastoralists, or internal displacement, especially if coping strategies are unsuccessful.

Droughts increasingly challenge pastoralists' coping strategies for livelihood shocks. One of the most common strategies is changing the mobility patterns of livestock to access farther pastures or water sources (Opiyo et al., 2012). Other strategies involve diversification of livestock species and economic diversification towards non-pastoralist activities such as crop farming, petty trade, rural-rural or rural-urban migration or charcoal burning.[5] However land fragmentation and the increase of insecurity and resource-related conflicts affect changing mobility patterns. Land fragmentation is the result of a trend of privatization and enclosure of land for diverse purpose such as farming, ranching, conservancies, and touristic reserves. As a consequence, traditional resources and migration routes are not available any more, which leads pastoralists to extend their mobility patterns farther to access natural resources in territories whose use is not previously agreed upon through shared resource agreements. Hence, the extension of mobility increases the risk of border conflicts with other pastoralist communities competing for the same resource (Opiyo et al., 2012). Land fragmentation, combined with conflict and perceptions of insecurity (Opiyo et al. 2012) can also led to concentration of herding in certain areas, which leads to over-grazing and further depletes natural resources. Because of the erosion of traditional coping strategies, the impacts of droughts are more significant than before as are livestock deaths and conflicts.

The complex link between drought and conflicts

Besides the impacts on natural resources, livestock and food security, questions were raised on the links between droughts and conflicts, be they cattle-raiding or resource-based ones (Sheekh et al., 2012 ; Opiyo et al., 2012). The discussion over this link is of particular importance in the assessment of drought-related displacement, often categorized as conflict-induced displacement (OHCHR, 2012:16).

The advocates of the positive drought-conflict link generally state that because of drought-induced resource scarcity, pastoralists' coping strategies involve extending of mobility patterns, which increases the risk of competition for the same resources and border conflicts on territory. Advocates refer to numbers to assert that there is a correlation between deaths led to clashes over resource and the presence of above-normal dry conditions. For example, 370 conflict-related deaths were reported in northeastern Kenya in 2011, mostly concerning pastoralists fighting over resource, whereas only 179 deaths were reported in 2010 (IRIN, 2012d). This approach of a positive drought-conflict link is also framed by many media reports (IRIN, 2009a ; 2009b ; 2011c).

Others advocate on the contrary for a negative link between droughts and conflict by showing that cattle-raiding is more developed during the wet seasons and the short-rains period (Opiyo et al., 2012). This theory bases itself on cultural reasons, this season being the time where pastoralists restock their herds, implement rituals of passage (that give importance to cattle raiding). Opportunities to sell livestock in good condition and at a good price are also more important during this period. For Opiyo et al. (2012), this "suggests that the two contesting resources-based theories apply not as discrete scenarios but in a 'resource abundance-resource scarcity' continuum, thereby creating non-deterministic relationship between resource availability and pastoral conflicts." Moreover, this argument for a non-deterministic relationship is strengthened by the importance of external factors and stakeholders in conflict motives and incentives. In some cases, political incitements are key triggers of conflict in pastoralist communities (see figure 1) (IRIN, 2009c ; 2011g ; 2013a).

Empirical evidence from a survey amongst the conflicting Turkana and Pokot communities at the Turkana-West Pokot border, highlight how the motives for cattle-raiding differ between communities: "on the Turkana side, drought-related hunger, poverty and lack of pasture are the central conflict stimuli, while on the Pokot side the accumulation of wealth, payment of dowry and the expansion of territory are the main motives behind raiding" (Opiyo et al., 2012).

These mixed analyses on the links between droughts and conflicts make necessary to analyse conflicts and associated displacements on a

5. The latter diversification being considered as negative because increasing resource depletion of scrubs and trees.

case-by-case basis without drawing early and simplistic conclusions. At the same time, politically-constructed conflicts would not happen if the issues at stake, such as access to natural resources and their depletion, were not felt as very problematic by the communities involved. It follows that displacement flows in 2012 in northern Kenya should be analysed in the light of this complex nexus of drought, erosion of livelihood systems and conflicts.

2. A TYPOLOGY OF DROUGHT-RELATED PASTORALIST DISPLACEMENT IN 2012

2.1. Qualitative and quantitative methodological challenges

A first set of challenges come from the displacement itself and the type of legal categorization it leads to. By definition, an IDP is a person that was "forced" to move. Yet, the pastoralist lifestyle is based on mobility, adapting to rainfalls and resource availability, which are sometimes scarce or far away, leaving them "no alternative" but extending their patterns to access the resource. As a consequence it is not easy to differentiate their regular forms of movements and forced displacements, and monitoring flows is problematic (Sheekh et al., 2012). The same difficulty applies for pastoralists moving to urban centres or refugee camps during droughts after having lost all or large part of their livestock, or before drought in anticipation. Secondly, it is difficult to distinguish whether displacement are temporary or not, because of the lack of access to information on the situation of IDPs once they are displaced. The few assessments realized by OCHA and the IDMC provide for aggregated numbers but generally do not precise the situation of IDPs, the assistance given to them, their patterns of return. Finally, some pastoralist found in Northern Kenya may be of bordering States, especially Somalia. They cannot therefore be considered as IDPs, although belonging to cross-border pastoralist communities. The legal category of IDPs therefore finds its limits in the light of the human realities on the ground. Additionally, when displaced, pastoralists generally do not identify and consider themselves as IDPs but rather as pastoralists without livestock – which is extremely grave in pastoralists' culture[6].

A second row of challenges concerns the triggers of drought-related displacement. Pastoralists themselves identify drought as a major cause of their displacements.[7] But drought is generally not responsible alone, as our first section widely emphasised. It is sometimes difficult to identify the first factor that contributed to displacement and/or loss of livestock because conflict or cattle-raiding can precede or follow drought-related cattle deaths. Even in discussion with pastoralist communities, it appears to be difficult to identify the first factor that led to displacement.[8] On the whole, cattle-raiding, resource-based conflict and loss of livestock (triggered by drought, conflicts, or both) appear to be the main factors contributing to drought-related displacement.

Thirdly, due to lack of data on pastoralists communities, it is very difficult to identify precisely which communities are most likely to be displaced. However, nomadic communities that are extremely reliant on livestock and less diversified are more likely to be strongly impacted by drought and the loss of livestock and be subsequently displaced.[9] Finally, pastoralist communities' reaction to environmental drivers and drought may vary greatly hence complicated the possibilities of systemizing their responses. Indeed, they will be different according to their internal social organization, their integration and access to state and non-governmental organization (NGO) services as well as the economic resources and asset base they can tap into[10].

2.2. A typology of pastoralists forced migration

Providing with a clear typology of drought-related displacement is hence a main challenge. Yet, this article try here to assess the variations amongst incentives for migrations and migrants' profile. The first main aspect of distinction is the direct or indirect impact of drought on the decision to migration.

1) Direct drought-related displacement: Interestingly, the drought as a push factor as been little addressed in our context.[11] This type of displacement is reported to be rare: out of 30 communities surveyed for a research purpose, only one declared to have been displaced only by drought, following total loss of livestock.[12]

6. Interview with Justin Ginetti, 5th April 2013 ;

7. Interview with Martina Caterina,, IDMC, 8th April 2013.
8. Idem.
9. Idem.
10. Interview with Malika Peyraut, 14th March 2013.
11. Date of redaction of the article.
12. Interview with Martina Caterina, 8th April 2013. Further information can be accessed in the report of IDMC on

Yet, the drought of 2011 has probably led many Kenyan Somali pastoralists of north-eastern Kenya to flee to refugee camps of Dadaab, claiming to be Somali refugees, and register as *prima facie* refugees (with reduced individual procedures to determine the refugee status, usually applied in situations of mass movements). This phenomenon is thought to happen by many researchers, with high uncertainty on its extent because of absence of any monitoring.[13] This phenomenon has grave consequence in terms of human rights because once registered as refugees, pastoralists lose their rights as Kenyan citizens.[14] Another practice of certain Kenyan pastoralists would be to go into the refugee camps temporarily in order to access services (food, shelter, health, education) and then leave.[15] This is further corroborated by members of pastoralists communities themselves stating that "some families are disguising themselves as Somali refugees to get food and medical assistance, not because they are corrupt but because they are desperate" (IRIN, 2010c). These migration flows to refugee camps in seek of service provision can be seen at the same time as a voluntary migration as a coping strategy, or as an obligation for survival, technically classified as internal displacement.

Indeed, the same applies for migration in urban settlements. According to OHCHR (2012:16), "increasingly severe and more frequent droughts {...} have forced many to search for new forms of livelihoods, including in urban areas. However, there has been a tendency in Kenya to consider that these groups are not displaced, since they are by definition mobile". The drought of 2011 has likely driven many pastoralists into urban and peri-urban areas. There, the situations might have differed significantly between individuals and communities. Either the whole family could have migrated in urban areas, or some members of the family. Moreover, some could have used this urban migration to access new economic resources and come back to their former lifestyle few months after or support it, while others could have stayed indefinitely in urban areas and permanently abandoned the pastoralist way of life16. It practically means that pastoralists that moved to urban areas in 2011 might still be there in 2012, with little recognition and visibility on the issue (as the Isiolo conflict illustrates (IRIN, 2012b).

The latter category of urban migrant pastoralists that do not come back to their traditional lifestyle is generally referred as "pastoralist drop-outs[17]" (IOM, 2010). Even though the term is well known, there is still little research on the issue. A baseline study by IOM (2010) in Garissa showed that a common feature of all the dropouts was the complete loss of livestock. Most of them were strongly vulnerable in terms of food security, shelter and access to water and generally lived off of wages from day-to-day informal odds job. IOM considers that the situation of pastoralist drop-outs is comparable to internally displaced persons (IOM, 2010). However, dropouts are not a homogeneous group because "they range from destitute persons to those who have adapted other livelihoods and may be thriving within them" (HPG, 2010). While destitute dropouts could be considered as IDPs for the purpose of assistance, how "thriving" dropouts should be categorized, is another issue. Another issue concerns the categorization of these dropouts for the purpose of aid and whether they should be entitled to "pastoralists policies" and assistance, including food aid, or considered only as urban population (HPG, 2010).

These complex urban migration flows are blurring the distinction between coping adaptative strategies and internal, rather forced, displacement. It is likely that they happen chronically, including in 2012, but there is no information on the scale of it, which precludes further understanding of means of prevention, assistance, and durable solutions for these specific displaced persons.

2) Indirect drought-related conflict displacement: in 2012, five main areas of conflict provoked flows of IDPs – or were hosts to enduring internally displaced persons. UNOCHA (2012b) reported 112,000 displaced and 412 killed in 2012.

The following table reviews the most important to assess the extent to which conflict can be linked to drought-related factors, such as issues concerning livestock, resource access and resource depletion. The core of the conflict dynamics is linked to cattle-raiding/livestock issues, or grazing land/water issues, and therefore has environmental dimensions. It cannot be concluded that drought-related stress factors on the environment are the primary factors for conflict and subsequent death and displacement. On the other hand it cannot be contested that the resource depletion associated

displaced pastoralists published at the end of 2013.

13. Interview with Justin Ginetti, 5th April 2013 ; Interview with Malika Peyraut, 14th March 2013 ; Interview with Nuur Sheekh, 30th April 2013.

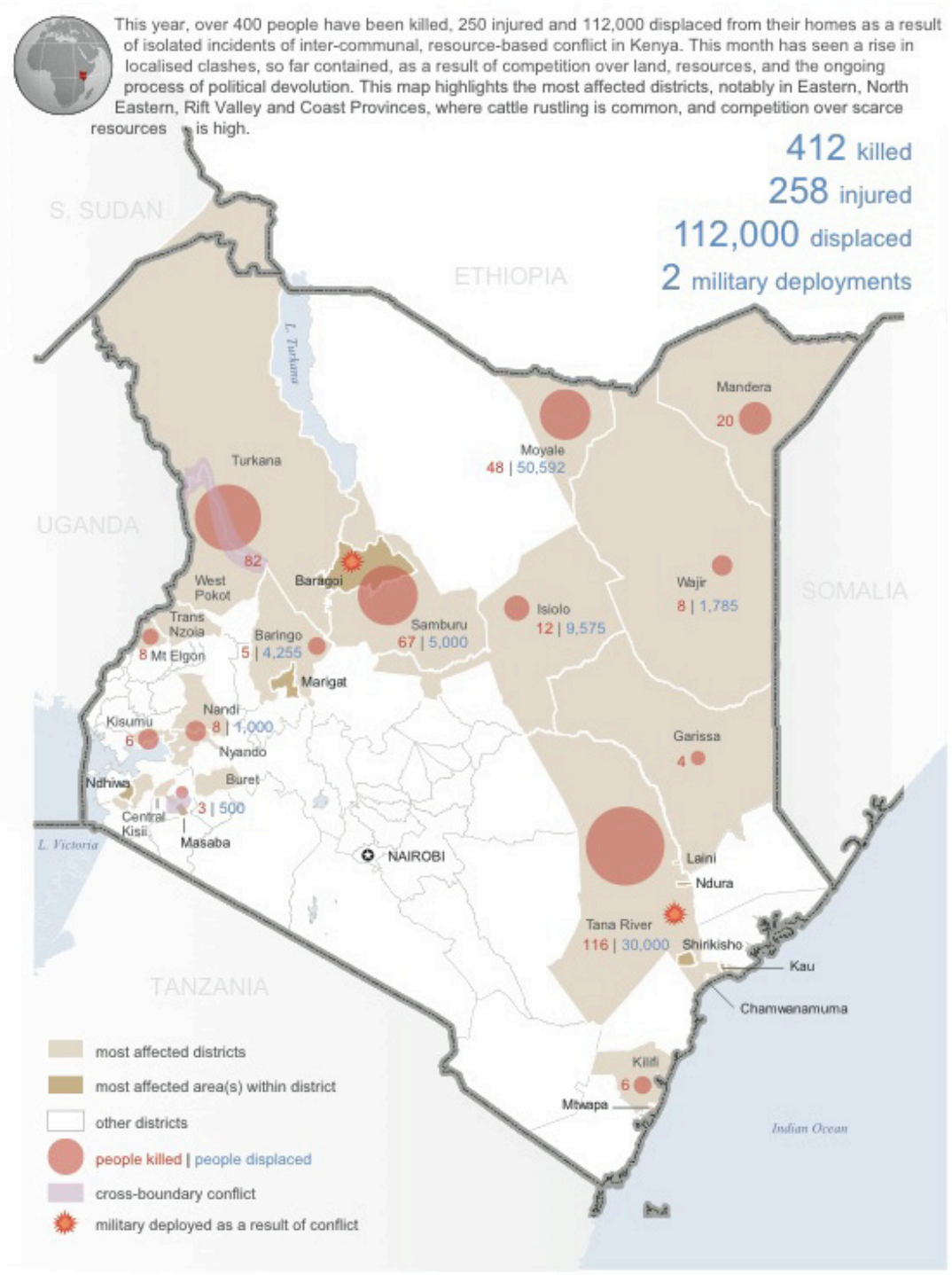
14. Interview with Malika Peyraut, 14th March 2013.

15. Interview with Justin Ginetti, 5th April 2013.

16. The assessment of factors behind this choice of temporary or permanent urban migration is beyond the scope of this study.

17. The term encapsulates all the pastoralists that have definitely left the pastoralism lifestyle – not necessarily urban migrant.

Map 2. Inter-communal conflicts by district (21 November 2012)



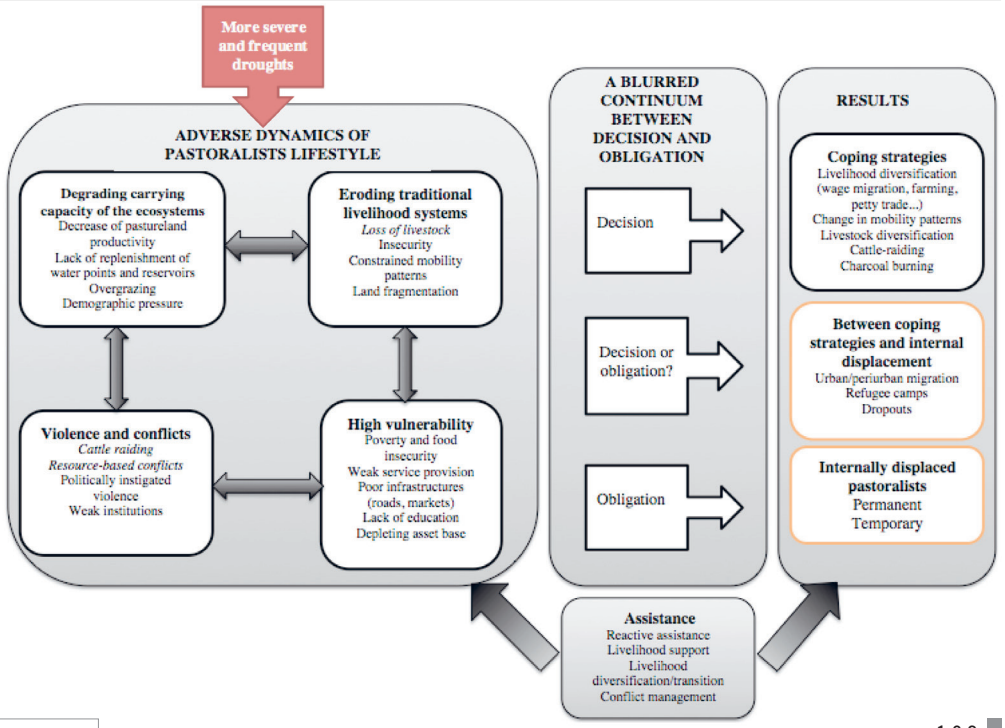
Source: OCHA, 2012.

Table 1. Conflict-induced displacements in 2012 and assessment of their linkage with drought-related issues

Area	Number of IDPs as of 2012	Qualitative assessment	Linkage with drought-related issues
Turkana	0 for OCHA (2012b), over 3000 persons for other sources (Business Today, 27th March 2012)	*Cattle-raiding between Pokot and Turkana communities* Attacks by the Pokot were reported in March 2012 and explained by political dynamics for contest of border territories. It would have led to 3000 IDPs in neighbouring areas. Attacks of the same kind (also between Uganda border Dodoth or Toposa and Turkana) are regularly occurring every year and tend to increase during drought period. (IRIN, 2011e)	Conflicts perceived to be politically connected, but at the same time aggravated by drought impacts on resource depletion.
Samburu	Between 5000 (OCHA, 2012b) And 11000 (IDMC, 2012)	*Cattle-raiding based conflict between Samburu and Turkana communities* The Samburu massacre is closely linked to inter-community hostile dynamics between Turkana and Samburu since the 1990s linked with access to resource and cattle raiding. The displacement was triggered by a military deployment following the massacre of 42 police officers during an operation to take back stolen livestock in November.	It has been linked with climate change and increasing drought (ISS, 2012), with politics, as well as opposition to a disarmament programme.
Isiolo	9,575 (OCHA, 2021b)	*Conflict between Borana, Turkana, Somalis* Presented as cattle-rustling but thought to be politically-instigated in order to reach ethnically-based voting patterns before the 2013 election. Also linked to claims over grazing land/rights by different pastoralists communities.	A conflict "about political numbers, not resources because civilians, including women and children are being killed and nothing stolen" (IRIN, 2011g). On the other hand, the conflict was linked the presence in 2012 of Wajir/Mandera pastoralists that had previously migrated in the town during a drought period (IRIN, 2012b).
Moyale	50,592 (OCHA, 2012b)	*Conflicts between Borana and Gabra* Moyale clashes were a tribal civil unrest due to historical lands/ territorial disputes, the upcoming general elections and historical disagreements/injustices (KRCS, 2012).	"A complex interplay between ecology, politics and ethnicity" (KCRS, 2012)
Tana River	30,000 (OCHA, YEAR)	Conflict between semi-nomadic Orma and farmers Pokomo Revenge conflicts, fuelled by a history of farmers-herders conflicts over grazing lands, pasture and water (IRIN, 2012c). Many displaced families seeking refuge in nearby forests, host communities and camps. Kenya Red Cross assisted with food and non-food items as well as medical care (IRIN, 2012e)	Said to be politically linked, but at the same time long-standing resource base. The 2011 drought has been described as a potential stress conflict factor in the area (IRIN, 2011a).

Source: author.

Figure 2. Direct and indirect drought-related displacement dynamics in pastoralist communities



Source: author

with repeated drought and the exhaustion of coping strategies are not important factors in conflict triggers, along with political, historical and economic factors,[18] and in the resulting migration patterns.

2.3. A simplified model of the relation between drought and displacement factors

The dynamics induced by the external shocks of drought in the livelihood systems of pastoralists are summarized in the figure below. Bidirectional arrows correspond to feedback interaction between factors. The words written in italic appear to be among the most important factors leading to pastoralist displacement, respectively cattle-raiding, resource-based conflicts and loss of livestock. The two boxes in orange symbolize the lack of conceptual understanding so far concerning the previously mentioned categories of pastoralist displacement.

3. POLICY RESPONSES AND CHALLENGES

The policy and legislative responses to the specific issue of drought-related pastoralist displacement is nearly absent in Kenya. The issue of pastoralist displacement in northern areas itself is not really acknowledged by policymakers, and suffer inexistent or incomplete data (Sheekh et al., 2012). This section will assess the policy responses given through different bias, responding to specific aspect of displacement: IDP protection frameworks, development in ASAL areas, disaster-management policies and security policies.

3.1. National responses and frameworks

Assistance and protection of internal displaced

Kenya recognizes the UN Guidelines for Internally Displaced Persons, which explicitly recall state's responsibility in its Principle 9: "states are under a particular obligation to protect against the displacement of indigenous peoples, minorities, peasants, pastoralists and other groups with special dependency on and an attachment to their lands" (UN, 1998). Yet, until recently, Kenya lacked frameworks to address pastoralist displacement. Kenya has a long history of internal displacement but started recently to formally recognize and address the problem during the post-election violence of 2007-2008 that displaced approximately 600,000 persons. This was one of the only cases where the Kenyan government implemented large-scale assistance for and monitoring of IDPs. On the whole, the monitoring, registration, assistance have remained ad hoc, weak and/or poorly coordinated, especially regarding pastoralist displacement. This subsection assesses the implementation of the IDP frameworks in Kenya in this very specific context, to allow for a comparative analysis and subsequent assessment of the situation of drought induced IDPs.

Monitoring and profiling of IDPs

The monitoring of internal displacement, through identification of IDPs, their locations, patterns of mobility, vulnerabilities and needs remains "extremely weak" (Metcalfe, 2011). In 2008, the Kenyan Government, along with stakeholders in civil society and UN agencies, created the National Protection Working Group on Internal Displacement (PWGID), "with the objective of enhancing the capacity of the Government and its overall response to internal displacement in the country" (OHCHR, 2012). However, official presence in northern Kenya is limited and the Government has not undertaken any monitoring exercise for displaced pastoralists (Sheekh et al., 2012).

Registration

Registration of IDPs is lacking coherence: except during the post-election violence period in 2007 and 2008, no displaced have been profiled or registered on the national database (IDMC, 2012). Other non-registered IDPs include: post-election violence (PEV) displaced persons in host communities and urban settings labelled as "integrated IDPs" by government (amounting to around 314,000 persons), people displaced by natural disasters (flood, droughts), development or environmental project (IDMC, 2012), inter-communal conflict (resource-based, cattle raiding, for other motives), and pastoralists migrating in urban and peri-urban settings following drought (OHCHR, 2012).

Assistance

Registered PEV IDPs have been provided with protection and assistance, though inadequate because of the lack of sufficient or nutritious food; access to shelter, water and sanitation facilities; and other services such as education and health care (OHCHR, 2012). Also, most of the assistance has been provided to landowner IDPs (IDMC, 2012), and fraud has also been reported (Kenya National Assembly, 2012b). For other IDPs, the lack

18. Especially issues related to land claims that sometimes date back to colonialism.

of registration entails a lack of visibility and recognition. Hence, assistance and protection, if any, are generally limited to food aid (OHCHR, 2012). According to IDMC, "many IDPs are displaced in areas of the country that are environmentally and economically vulnerable, and as such they enjoy fewer opportunities for integration and development. This in turn increases the likelihood of their living in situations of prolonged displacement" (IDMC, 2012:) This also applies for drought-related pastoralist displacement.

Return and durable solutions

A report of the Parliamentary Committee on the resettlement of the IDPs in Kenya criticized the return policies for registered PEV IDPs as being badly managed and flawed (Kenya National Assembly, 2012b). Concerning displaced pastoralists, no such assistance seems to have taken place. According to Sheekh et al. (2012) "as the displacement of pastoralists is little understood either qualitatively or quantitatively, they face a greater risk or protracted displacement. There is currently no conceptual understanding of durable solutions specific to Kenya's displaced nomadic population, and as a result no response that aims to achieve them". [19]

Possible impacts of the development of a new IDP policy

In October 2012 a National Policy on the Prevention of Internal Displacement and the Protection and Assistance to Internally Displaced Persons has been adopted after three years of drafting. The text is largely based on international and regional instruments such as the Great Lakes Protocol on IDPs and the African Union Kampala Convention – though Kenya has ratified none of them both. It provides a comprehensive, detailed and indiscriminate approach for management and protection of IDP. For example, the definition of IDPs includes persons internally displaced by "natural disasters whether or not triggered by the change of climate", "politically instigated or inter-communal hostilities such as competition over lands or other resources" (Kenya National Assembly, 2012a). As a consequence, pastoralists' internal displacement should finally be recognized.

Another central aspect is the provision for the set up of a data collection, registration and profiling system on IDPs, while taking into account right to privacy. The profiling is supposed to be carried within 30 days of an internal displacement (IDMC, 2012). Also, IDPs could in theory seek "legal recourse for compensation for life and property lost" because the state now is legally responsible to prevent displacement and can hence be held accountable (IRIN, 2012f). However, the implementation, especially in northern areas where resources and capacity-building are scarce, will be a tremendous challenge. The data collection system has not yet started to function, and it is unlikely that local administrations will be provided with enough resources to do so on the short-term.[20] Moreover, it remains to be seen if pastoralists migrating to urban areas during drought or for drought-related reasons will also be considered as IDPs and be the granted adequate assistance and protection.

Enhancing resilience and adaptive capacities

Disaster-management policies

Kenya has adopted several frameworks governing disaster management such as the draft National Disaster Management Policy developed since 2009, a National Disaster Response Plan, and the Climate change response strategy of 2010 (IDMC, 2012). However, these frameworks lack enforcement, adequate infrastructures and human resources, especially in northern areas (OHCHR 2012; IRIN, 2010a, 2013b). Additionally, the Kenyan National Assembly created in November 2011, the National Drought Management Authority to serve as the focal point for information-sharing, early-warning, rapid reaction and coordination of policies and measures targeting drought.

The successes of these institutions and policies remain however very doubtful. Communicating early warning systems towards pastoralists has to take their culture, beliefs language and local knowledge into account. Beyond information diffusion, infrastructural problems are also important as pastoralists are sometimes not able to access markets to trade their stock to anticipate drought hardships. Indeed the main challenge for disaster-management policies is the absence of local capacity-building actors and access to resources and funds to implement prevention, mitigation and relief actions. The existing contingency funds lack financial capacity. The long-term objective, according to Mohamed Elmi, the Minister of ASALs, is to access Adaptation Fund money of the UNFCCC for long-term interventions (IRIN, 2011f).

Beyond the State, another key actor in natural disaster response is the Kenya Red Cross Society, one of the most specialized humanitarian actors in responses to displacement, notably consequent to

19. The report on pastoralists displacement published by IDMC at the end of 2013 aims at providing a detailed review of displacement flows as well as a conceptual understanding of durable solutions.

20. Interview with Justin Ginetti, 9th April 2013; Interview with Nuur Sheekh, 30th April 2013.

natural disasters. Through its "tracing" approach,[21] it provides much needed information on migration flows of IDPs and refugees. It has provided assistance to floods-induced displaced people in 2012 (IDMC, 2012). Quite interestingly, the KRCS considers droughts, floods and inter-communal conflicts as part of one single "complex emergency" calling for unified funding, preparedness and response (KRCS, 2012). However there is no information on their assistance to drought-related pastoralists displaced or pastoralist drop-outs.

Development policies for Arid and Semi-Arid Lands

Development policies for Arid and Semi-Arid Lands have been limited during a long-time. A traditional approach of ASALs by government agencies as well as humanitarian actors has been short-term assistance, notably in terms of food. There was a common perception of ASALs as a "food aid sink hole" with little recognition of the economic potential of these areas (IRIN, 2011f). However, there seems to be a recent evolution in the past few years.

In 2008, the Ministry of State for the Development of Northern Kenya and Other Arid Lands was created – the only of its kind in the whole Horn of Africa. Moreover, the draft policy on the sustainable development of ASALs was approved in February 2013 after nine years of waiting (Kenya Rural Development Programme, 2013). It provides for investment in security, infrastructure, job creation, adaptation to climate change, management of drought, job creation and emphasizes the need for a "special treatment" of ASALs. But quite interestingly, none of these policies and approaches refers to the terms "displacement" and the term "drop-out" is referred only one time, without strategic approach.

Concerning on-going implementation, a livestock marketing board is in working process to provide support for the pastoralist livestock value-chain. Indeed, while Kenya is a net importer of meat (Government of Kenya, 2004), the livestock value-chain of pastoralists in ASALs has never been strongly supported by government (IRIN, 2011f).

Finally, the new Constitution of Kenya adopted in 2010 is supposed to provide opportunities for securing tenure rights and rights to natural resources of pastoralists communities, which could reduce the process of land fragmentation (around 15 per cent of the land in semi-arid areas is now used as national park or reserves) (IRIN, 2011f).

Security policies

Disaster-management and development policies will most likely remain ineffective if the security situation remained bleak in northern areas. Government policies on this matter have generally been criticized for their inadequacy, if not their adverse effects.

The Kenyan State has tried to decrease insecurity with strong disarmament programmes. Several operations seem to have fuelled inter-ethnic clashes and displacement, because the programmes were felt to be biased and heavy-handed (Sheekh et al., 2012). The proliferation of firearms from the Sudan and Somalia has severely undermined disarmament operations.

Conversely, the Kenyan State has also carried out community armament programmes to outsource security provision by turning pastoralist communities themselves into home guards and reservists. But many of the distributed arms ended up traded or used for personal security and even criminal attacks, fuelling the conflicts (IRIN, 2011e). This short-term security approach, coupled to the short-term food aid approach, has been interpreted by certain communities that end up demanding "bullets and food" from their government (IRIN, 13th July 2009b).

Long-term policies of conflict-management, peace-building to try to end cattle raiding and resource-based conflicts have been left to NGOs supporting informal resource-sharing agreements set up by communities themselves. But those agreements often break up as soon as the rain comes back and replenishes the resources. More, the decrease of the strength of traditional peacekeeping institutions, especially the role of elders in sanctioning conflict, is an issue upon which it is difficult to act. The issue of reconciliation for conflict-induced IDPs also plays a crucial role, but is rarely addressed on a large-scale and is poorly funded by donors (IDMC, 2012).

3.2. International responses and frameworks

Donor countries and international organizations support different measures targeting IDPs (though not pastoralist) and pastoralist development, from food assistance to livelihood transition.

Responding to internal displacement

Donor countries and international organizations have supported the post-election process in 2007 and 2008 and assisted the Government and other actors to monitor and assist PEV IDPs, notably with interventions to provide water, sanitation and shelter as well as technical support to develop

21. https://www.kenyaredcross.org/, accessed the 4th of July 2013.

the IDP policy through the setting up of a Protection Working Group (IDMC, 2012).

However the same level of interest and assistance has not been dedicated to displaced pastoralists and other non–PEV IDPs. For example, no organization has undertaken comprehensive surveys of the migration flows of pastoralists towards urban centres during the drought of 2011, as well as their situation and needs in 2011 and 2012. Aside from the KRCS, the organizations that have paid theoretical attention to the issue are UNOCHA, the IOM (through the focus on drop-outs) the Internal Displacement Monitoring Centre (IDMC) and the Institute for Security Studies (ISS). 22

Enhancing resilience and adaptive capacities

The response of the international community to pastoralist situation in northern areas is a continuum from short-term food assistance (historically the most important), to livelihood support, livelihood diversification and finally livelihood transition (the three latter remaining largely project-based).

Responses to drought emergencies have often been focused on short-term reactive food aid, because of the absence of long-term projects focusing on livelihood resilience and supposed lack of mechanisms to fund pre-emptive action. For example massive humanitarian funding for food assistance during the 2011 drought was only released when UN officially declared state of famine in July 2011, whereas early warnings of poor rainfall were noted since May 2010 (Fitzgibbon, 2012). During the last droughts of 2008/2009 and 2011, the humanitarian communities also fell short of understanding the utter importance of focusing on livestock as key assets of the pastoral communities, even though things seem to evolve with the development of the Livestock Emergency Guidelines and Standards (LEGS) (IRIN, 2011c) and the understanding of the importance of timely restocking programmes to supplement communities that have lost their livestock with new ones.23

Other projects focus on livelihood support, service provision (such as health and education), livestock assistance, information sharing, risk management and adaption to climate change. For example, the International Organization of Migration has recently opened a pastoralist dispensary in Turkana.24 The IIED and the Climate Adaptation Fund are funding early warning projects tapping into pastoralist use of radio and mobile phones.25 USAID and UNICEF are developing mobile schools projects.26 Livelihood diversification is also promoted and supported by international actors, for example through training in small-scale farming for pastoralist women and targets pastoralist dropouts that have lost their livestock and need to start a new livelihood (IRIN, 2012a). Finally, projects of livelihood transition are promoted, notably by Oxfam, to support pastoralists in developing new livelihoods such as small businesses.27 Notwithstanding, these long-term approaches are not yet developed and coordinated on the same scale as food assistance.

3.3. Policy recommendations

The previous analyses call for several non-exhaustive policy recommendations in order to improve the situation of displaced pastoralists.

Develop a better knowledge on the nature, scale and reasons of migratory flows as well as of the specific needs of displaced pastoralists. First, the Government of Kenya, international organizations, humanitarian actors, researchers and donor countries must work together to develop adequate assessment methodologies that fully grab the complexity and multi-causality of such flows. This is a necessary step towards developing a stronger conceptual understanding of these displacements, of the possibility of prevention, and of durable solutions. In Kenya, the Ministry of State for Special Programmes and the Ministry for the development of Arid and Semi-Arid Lands could work together to develop new assessment tools and methodologies. Second, this development of methodologies would adequately support the data collection and profiling system that will be set up by the new IDP policy of Kenya. However, due

22. UNOCHA has realized surveys and assessment of pastoralists displaced by floods and/or by inter-communal conflicts in 2012. The Internal Displacement Monitoring Centre has realized one scoping study to cast light upon the issue (see Sheekh et al., 2012), and will also publish in October 2013 an extensive in-depth qualitative and quantitative assessment of the scale and factors of pastoralists displacement in Northern Kenya.

23. Interview with Nuur Sheekh, 30th April 2013.

24. http://www.iom.int/cms/en/sites/iom/home/news-and-views/press-briefing-notes/pbn-2012/pbn-listing/pastoralist-dispensary-opens-in.html (Accessed the 30th of April 2013)

25. http://reliefweb.int/report/kenya/kenya-information-strengthens-pastoralists-resilience (Accessed the 30th of April 2013) ; http://reliefweb.int/report/kenya/cell-phones-revolutionizing-kenya%E2%80%99s-livestock-sector (Accessed the 30th of April 2013)

26. http://kenya.usaid.gov/programs/education-and-youth/1015 ; http://reliefweb.int/report/kenya/kenya-educating-nomadic-pastoralist-children-low-cost (Accessed the 30th of April 2013)

27. http://blogs.oxfam.org/en/blogs/12-07-10-helping-pastoralists-cope-changing-way-life-kenya (Accessed the 30th of April 2013)

assistance and capacity-building for implementation and profiling will be needed, especially at local level – otherwise the policy will remain mere words.

Strengthen the use of climatic early-warning systems at all levels, especially at local and pastoralist community's level. The communication of information towards pastoralist communities also needs to be done by taking into account their specific cultural values, beliefs and perceptions to trigger adequate responses (IRIN, 2010b).

Develop proactive policies to improve livelihood opportunities of pastoralists in northern Kenya as part of the long-term answer to current issues. The Government of Kenya should realize the importance of livestock value-chain, and adequately develop markets and livestock value-chain support system. This should be done by paying attention to the fact that for certain pastoralists communities, integration in the market economy and livestock selling for cash is not a natural reasoning (The Guardian, 2012). Livestock assistance preparedness needs to be improved to be able to anticipate droughts and food security emergencies.

Promote conflict prevention, resolution, as well as reconciliation The question of resource-based conflicts, cattle-rustling and underlying ethnical hostilities fuelled by political incitements and other economic incentives, is one of the most important issues in Northern Kenya nowadays: it is at the same time the result of several decades of marginalization, resource depletion and poverty, and a cause of livelihood erosion and displacement. While solutions for this problem are specific for every counties and communities, the involvement of elders and religious and traditional leaders, support for community-based resource-sharing agreements (Opiyo et al. 2012), development of early-warning systems could be possible means of advancing conflict prevention and resolution. The issue of reconciliation is also key and will need to be addressed in order to achieve peaceful coexistence and resource-sharing of communities.

Consult and associate affected pastoralist communities Finally, a transversal recommendation is to consult and associate affected pastoralists communities in the development of the previously mentioned measures. Realizing adequate profiling and qualitative assessments of their needs would be a first step for such integration.

CONCLUSION

Drought-related internal displacements of pastoralists in northern Kenya are multi-causal and complex. The resource base and the coping strategies of the communities are slowly eroding as cyclical drought affects more and more citizens, triggering vicious circles of vulnerability in already marginalized areas. It follows that the impact of drought on displacement is mostly related with loss of livestock, erosion of livelihood systems and/or increase of the resource-based conflicts as well as cattle-rustling – along with other political, economic and historical factors. Drought-related displacement can also be linked to urban migration that can be seen either as diversification strategies or as the result of the destitution of pastoralists "drop-outs", that can be compared to internally displaced persons: any generalization is difficult as there is little research and assessment on these migration flows. Pastoralist communities with eroding livelihood can also end up migrating to refugee camps. In 2012, the main displacement cause amongst pastoralist communities was conflict. In most case, drought-related issues, i.e. resource depletion and livestock, were closely related to conflict drivers – along with many other factors, composing a complex nexus of drought – livelihood erosion – conflict leading to death and displacement.

Attention and assistance given to environmental displacement of pastoralists in Kenya are scarce and incomplete. At the national level the only IDPs to be considered and assisted so far by the government are the post-election violence IDPs, the other being non-registered. Prevention of displacement, in the form of sound policies for ASALs development, disaster-risk reduction and security are still lagging behind. The government has been promising new IDP laws, drought-management and ASAL development policies, but implementation will be challenging. Security concerns remain highly problematic and so far not really addressed. At the international level, few organizations have paid attention to pastoralists' displacement, and even less to drought-related displacement and dropouts. However, it seems that the approach towards pastoralism is slowly shifting from food assistance to long-term support, diversification and/or transition of livelihoods. Donor countries and humanitarian actors were instrumental in assisting PEV IDPs, and should now assist Kenya in implementation of its new policy, with due capacity-building.

Finally, the review of secondary sources of information of drought-related and conflict-related factors in displacement flows points to differing perceptions and narratives among stakeholders – such as the media, local communities, policymakers and aid workers – with respects to the relative importance of drought-related and conflict-related factors, which calls for further field research to question these perceptions.

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THE FUKUSHIMA EVACUEES' RETURN

CLOÉ DEVLIN, LUCILE LECLAIR AND TIMOTHÉE DIDIER-BANDOU

INTRODUCTION

On 11 March 2011, Japan's Tokohu region was devastated by a triple disaster that had a "profound and transformative effect on Japanese society" (Hasegawa, 2013). The destruction caused by the earthquake, tsunami and nuclear meltdown exceeded the authorities' expectations and had caused one of the worst nuclear disasters in history (ibid): in total, 16,000 people died and hundreds of thousands were displaced. As of mid-2013, a large part of those evacuated are still unable to return to their homes.

This article interrogates why the Japanese government's decision to encourage return has not yielded the intended results and why migration has not been considered as an adaptation strategy. It therefore explores the present situation of the evacuees: while some have indeed returned to their communities as a result of the governmental support upon population's return, the majority have not. Fears over radiation levels and financial concerns are especially prevalent. In light of the alarming radiation levels detected in Fukushima and the surrounding prefectures, resettlement could have been considered a viable policy option for the Japanese government. Despite an initial effort to provide assistance to those who wanted to resettle, political discourse remained predominantly orientated towards an ambiguous policy of return. Most of the evacuees lost their livelihoods and were in very difficult financial situations: return would have been a realist possibility for them as long as the State would have financed the reconstruction. Along with the evacuees' perception of displacement, their current considerations on their future prospects as well as the policy responses formulated by the Japanese government, the financial implications of return versus resettlement are also key in the article: we will try to assess to what extent the promised compensation contributed to evacuees favouring one strategy over the other. The paper focuses on the nuclear evacuation as it remains the most political and controversial consequence of the 3/11 catastrophe.

1. THE POLICY FOR RETURN

After the 3/11 disaster, a "return to normalcy" was at the center of the Japanese society's recovery objectives and priorities. However, this urge for normality resulted in the obliteration of the events and their consequences rather than in development of new coping strategies, based on the very acknowledgement of the events themselves. The policy of return can therefore be understood as an illustration of this desire to return to the previous status quo.

1.1. The tsunami evacuees: return and resettlement

Out of the 470,000 people displaced in the aftermath of the 3/11 disaster, about 150,000 people were taken off the list of evacuees in 2012 as they returned to their homeland or resettled elsewhere. Those who returned quickly were almost entirely tsunami evacuees who, despite facing many administrative and financial problems, received some support from the Japanese Government. Indeed, in 2012, Japanese authorities pursued the reconstruction efforts whose cost Reconstruction Agency Minister Takumi Nemoto was reappraised by "6 trillion to 25 trillion yen" (EUR 46 million to EUR 190 million) (Nemoto, 2013). At the end of 2012, the grand majority of infrastructures were rebuilt and rendered operational. Electricity, gas, water, phone lines, roads, harbours and railways were restored back to 96 per cent of their capacity on average (Reconstruction Agency, 2012).

However, such a percentage can be misleading: if it indicates that facilities were largely restored, it also tends to hide the remaining difficulties faced by the population as private structures, which were left to the evacuees to rebuild, did not have such high percentage of restoration. A reason for this lies in the administrative and financial problems that prevented evacuees from reconstructing the structures necessary to their reestablishment. The EUR 30,000-worth financial support and the EUR 146,000 worth low-interest housing loans were not enough to give the evacuees sufficient resources to undertake the reconstruction projects and compensate the financial losses they underwent - often jobless and facing a 'double loans' (situation of those paying loans both for their former house – destroyed by the catastrophe – and for their new one) (Hasegawa, 2013)

The resettlement policy faced additional challenges. The need for new land raised both financial and spaces challenges as evacuees were confronted with the difficulty of finding available space for reconstruction because of the geographical characteristics of the Japan, and the sacred character of ancestral lands[1]. The little coordination between the state and the local authorities – in terms of the grant of financial support, for example - added obstacles to the implementation of the resettlement schemes.[2]

Because it creates new alternatives for the evacuees, the resettlement policy is not *per se* an instrument for maintaining the pre-disaster status quo. However, the desire to return to 'how things were before' was omnipresent in the way the policy was conducted. Indeed, in order not only to rebuild homes but also to rebuild the previous communities ties, the government laid down the condition that resettlement should be carried out collectively. To be resettled, each family was supposed to form a group of families (at least four) with whom they would collectively decide of the resettlement details. Only on this condition would they receive government assistance. If this policy was intended to respond to the population's desire to rebuild the community ties shattered by the 3/11 disaster (Hasegawa, 2013), it created more problems than it offered solutions, as it was often very difficult for evacuees to get in touch with friends and former neighbors who were spread around the region during the evacuation. Accordingly, the government's will to encourage the reconstruction of traditional community dynamics hindered the possibility for many evacuees to move forward.

1. Interview with researcher Reiko Hasegawa, March 2013, IDDRI Paris
2. Ibid.

The analysis of how the reconstruction and resettlement policies have been carried out enables to identify the underlying attitudes around the 3/11 catastrophe. Earthquake and tsunami being natural catastrophes, the government-led response did not acknowledge any form of responsibility for their grave consequences. It paradoxically facilitated the government's response, considered as their normal duty to protect its population. Overcoming the tsunami evacuee crisis has been more about coping with financial and administrative problems than about facing criticisms of risk prevention and management, much more highly politically sensitive in the context of the nuclear disaster.

1.2. Nuclear evacuees: From forced displacement to forced returns

The difficulty of returning

Unlike some of the tsunami evacuees, practically none of the nuclear evacuees have been able to return. They represent 160,000 of the 300,000 people still evacuated in 2012 (Bøhmer, 2013), of whom 100,000 are found within the Fukushima Prefecture and 60,000 outside (Fukushima on the Globe, 2013). Most of the zone within a radius of 20 kilometres from the nuclear plant is still completely forbidden because of radioactive contamination and nuclear evacuees still faced arrest or fines if they tried to go back within the forbidden areas (McCurry, 2011). As of 2012, Fukushima locals have been allowed to visit their properties during the day but still cannot stay the night nor cultivate their land (Bøhmer, 2013). This impossibility contrasts with the evacuees' expectations as, one year after the disaster, a majority still wishes to return (Imai, 2012). Those who have returned are to a great extent the elderly since "they do not have that much time or energy left to rebuild" or resettle (Aizu-Wakamatsu, 2012). However, for the majority of the evacuees, returning remains difficult. Fear of the consequences of radioactivity was omnipresent in the evacuees' testimonies, which expressed high mistrust towards the Japanese government's declarations on the gravity of situation (Myles, 2013). In addition to reappraising the 'acceptable' rate from 1 to 20 millisieverts per year, the Government was accused by Greenpeace of lowering the actual figures in order to conceal the risks of radioactivity (ibid). The mistrust towards the government raised the concerns on the actual safety of going back home, an option that was gradually dismissed: between June 2011 and March 2012, the proportion of evacuees wishing to return dropped from 80 per cent to 60 per cent

(Hasegawa, 2013). However, this evolution was not taken into account by the government officials who deployed an active policy in order to push for return.

The pressure upon return

Financial pressures

In March 2012, the Japanese Government launched a plan to organize return to the evacuated areas according to their radioactivity level. Areas with less than 20mSv/year[3] were considered as "areas for which evacuation orders are ready to be lifted" (Hasegawa, 2013). In the areas in which there was between 20mSv and 50mSv/year, evacuees were expected to be able to return within two to three years (Ibid). Finally, areas with more than 50mSv/year were considered to be inhabitable again after five years (Ibid). This plan was rolled out unilaterally by the Reconstruction Agency[4] that, without consulting the population, made it the base for the continuation of financial support (Greenpeace, 2013): those who would not return to an area officially presented as 'safe' would be considered as voluntary departures and therefore would not be entitled to government assistance anymore. Therefore, from a situation of forced displacement, the victims of Fukushima increasingly suffered from forced return. An evacuee from Naraha expressed the frustrating situation of many of the displaced people: "The government forced us to evacuate in the first place. Now it's trying to force us to return without much information." (Hasegawa, 2013).

Financial pressures for return can also be found within the compensation policy. Initially, each of the 160,000 Fukushima evacuees was promised EUR 350,000 in compensation for material damages, costs of evacuation and possible trauma (Le Figaro, 2011). Compensation was regarded as an essential mechanism to help people financially recover from the disaster and to invest in the reconstruction of the devastated areas. However, the compensation effort was quickly redirected from public to private entities, namely Tepco the main responsible party. A Greenpeace report, released in February 2013, pointed out that many firms who helped design and build the Fukushima reactors were not held legally responsible and were not required to pay compensation to the victims (Greenpeace, 2013). As a result, at the eve of 2012, only one thousand individuals had been compensated – a little more than half a per cent of all evacuees (Le Figaro, 2011). Many evacuees blamed the long and complicated administrative procedure imposed by the operator of the power plant, Tepco, who provided a 156-page explicative document to help the evacuees fill out the necessary forms (Ibid). After public and government pressure, Tepco simplified the procedure and hired 7,600 people to work on analyzing individual files, promising to hold numerous information-sharing sessions and to open specific help desks for the evacuees (Ibid).

However, a schism emerged between the Government and Tepco on the nature and responsibility of compensation. Presented by the Government as the main responsible party for the nuclear catastrophe, Tepco refused to assume an expansive interpretation of the compensation policy as deplored lawyer Shigeo Takanashi: "Tepco believes that the responsibility for decontamination belongs to the State, not to the firm, which is questionable" (*Le Figaro*, 2011). But even at the individual level, Tepco demonstrated some reluctance to hand out compensation, as it mostly handed out "temporary compensation" which victims of the meltdown were expected to repay (Willacy, 2013). Yukiko Kameya, a 68- year old nuclear evacuee, currently living in a "tiny public housing apartment in Tokyo's (…) urban sprawl" (Willacy, 2013), was initially given EUR 14,000 by Tepco, of which EUR 8,000 was deemed "temporary" (Ibid), an amount that the evacuee could have to reimburse once a final settlement was decided. Such uncertainty concerning financial recourses represents a strong obstacle in the search for life alternatives.

The importance of the pressure for evacuees to return is relevant. In contrast to the earthquake and tsunami, the responsibility for the nuclear accident is partly attributable to the Japanese State and its 'zero risk' guarantees regarding nuclear power. The issue around the nuclear evacuees' situation is therefore much more political than for tsunami evacuees. The "forced march" (Linton, 2012) towards status quo launched by the Government through its different post-disaster policies could be seen as a way to avoid the debate raised around Japan's energy policy. Reducing the visible consequences of the nuclear accident by favoring evacuees' return may have been a way to reduce the controversies on nuclear power. Nuclear safety being a condition for return, lowering radioactivity levels has become a huge challenge for the government to be able to carry out a return policy. Decontamination was to be the key policy for return and, as such, many efforts were put into it.

3. "mSv" stands for millisiverts, the unit used to measure the impact of radiation on human beings.
4. Interview with researcher Reiko Hasegawa, March 2013, IDDRI Paris

The decontamination policy

In 2012, decontamination was at the core of the Government's policy for return and was, as such, carried out doggedly. The objective was to reduce radioactivity to below 20 mSv/year by 2014 (Tabuchi, 2013) on a territory of about 13,000km (Linton, 2012). To achieve this goal, around EUR10 billion were mobilized on a period of three years (Linton, 2012). The Government presented this immense decontamination effort as the only solution Japan had in order to overcome the evacuees' crisis. Making the comparison with the Chernobyl nuclear accident, a representative of the Japan Atomic Energy Agency, Shinichi Nakayama, explained: "Conversely to the very vast USSR, Japan cannot afford to abandon a part of its territory" (Linton, 2012). Indeed, with a population density of 351 inhabitants/km[5], giving up even a small part of the territory would entail huge extra demographic pressures on the other regions. Decontaminating was therefore considered as necessary. Nonetheless, deep concerns have arisen about the current decontamination policy, particularly in relation to its environmental impact. In order to lower radioactivity, 15 to 31 million cubic metres of soil are to be scraped off the ground's top layer (The Guardian, 2012); trees and grass have been cut down (Linton, 2012); dead leaves and forests' natural compost have been removed (*World Nuclear News, 2011*); all of this being stocked in millions of plastic bags or dumped into rivers (Tabuchi, 2013). Although it is still too early to know exactly what will be the long-term environmental consequences of decontamination, some impacts have already been noted and are foreseeable(The Guardian, 2012). First, the removal of soil and trees increases the predisposition to floods in the region that would be devastated again in the case of a new tsunami. Second, in addition to this, the removal of dead leaves and natural compost will probably durably affect soil quality, which hinders the reestablishment of a 'normal' natural and agricultural activity. Third, the release of radioactivity in sea waters might durably affect marine life in the Pacific (*The Guardian*, 2012). The chemist Elizabeth Grossman early reported that nuclear molecules were found in higher and higher stages of the local food chain (*The Guardian*, 2012). In light of all this, radiation expert Tomova Yamauchi criticized the decontamination policy as "absolutely irresponsible" (Tabuchi, 2013) as "Fukushima nuclear cleanup could create its own environmental disaster" (The Guardian, 2012). This "environmental disaster" (Ibid) was even more controversial as it was not followed by the expected decrease in radioactive levels.

Although current decontaminating methods can be very effective in the short term (in some case, radioactivity was divided by five after a decontamination operation (Linton, 2012)), some note global ineffectiveness in the long term. With rainfalls, radioactivity comes back sometimes to reach even higher levels than before decontamination. Greenpeace nuclear expert Heinz Smital made statements on the impossibility to decontaminate efficiently: "It's not possible to decontaminate whole swathes of land, mountains, rivers and riverbanks. You can't get rid of that contamination" (Smital, 2013).

Despite the inefficiency of the decontamination policy – which has led the government to recognize that there was little hope of recuperating areas where radioactivity exceeds 50mSv/year (Linton, 2012) - few other alternatives have been explored. According to Kobe University professor Tomoya Yamauchi, the Japanese Government should have prioritized evacuation to frenzied decontamination: "For very affected cities, we can of course choose to destroy and rebuild everything, which is very complicated. But we can also evacuate, at least pregnant women and children" (Linton, 2012).

The Government's determination in decontaminating reveals the logic of its response to the 3/11 disaster, considering population displacement as a temporary "crisis" response rather than a viable long-term adaptation strategy. As such, the post-catastrophe policies tended to privilege return, contain population movement, and aim for status quo. However, 'going back to before' is not only not always the best solution to overcome a crisis, it is often impossible.

2. THE LIVING CONDITIONS OF THOSE DISPLACED

Face to the impossibility to return home, Fukushima evacuees were left with few alternatives: stay (where they were evacuated or in their contaminated homelands) or leave elsewhere 'voluntarily'. The latter option was the least implemented and most of them chose to stay, despite the difficulties it supposed.

2.1. Sheltering in precarious evacuation structures

Out of the 470,000 persons initially displaced, about 320,000 are still evacuated in temporary housing developments in the prefecture or in subsidized apartments where rent is free but

5. As of 2011. World Bank database. http://data.worldbank.org/indicator/EN.POP.DNST (consulted on August 19th 2013)

utilities are not[6]. Face to the impossibility to return home because of the many obstacles cited earlier, many feel "stuck between past and future" (Greenpeace, 2012). "I don't have any sense of progress or goal. I'm just living day to day" said 63-years-old Itsuko Suzuki, an evacuee who has been living in a temporary house for two years (Bird, 2013). As of 2013, her situation is an illustration of the one lived by the evacuee who are also face deep uncertainties about their future. Recognizing the difficulties of immediate return, the Japanese Government planned to extend the period during which evacuees could remain in the temporary houses to an additional two years (until 2015) (Ibid).

Although living in temporary houses represented a considerable qualitative decrease in many evacuees' standard of living, it was generally preferred to returning home. Chizu Matsumoto, a young mother living in temporary facilities because her house is so contaminated that the government did not plan to clean it up, highlights the relief that seeing her boys is good health and far from radioactivity is (Bird, 2013). Health preoccupations have generally overridden the evacuees' urge to return. As result, many decided to stay away from their contaminated homes and keep living 'temporarily' in secured areas. This option was however not feasible for everyone and many kept on living in their contaminated homelands.

2.2. Staying in contaminated homes

Fukushima's "last man" (Pagnotta, 2013)

After the 3/11 accident, the 20 km radius-zone around the nuclear power was entirely evacuated and entering it is still strictly forbidden. For some, evacuating was more complicated. In particular, among the farmers, the evacuation has left a long-term trauma because of the strong attachment they had to their land. Some even committed suicide when forced to destroy their contaminated harvests (Robin, 2012).

For many farmers who were evacuated, it was morally impossible to abandon their animals. However, no evacuation program was organized for animals, who were slaughtered or abandoned. Facing this situation, one farmer, Naoto Matsumura, decided to stay in the forbidden 20km-radius zone and took care of these animals. According to Antonio Pagnotta, Naoto Matsumura lives his struggle as a demonstration against Tepco and the Government (Pagnotta, 2013). Naoto Matsumura, 55, was in his farm on the 11 March 2011 and has been exposed to the extremely high radiation levels since then. After being forced to leave by Japanese soldiers, he was rejected by his family because of their fear of him being contaminated. When he was turned out a second time by the over-crowded refugee camp, he decided to go back into the forbidden zone, where he used to live (Arte Journal, 2013). As the only current inhabitant of the prohibited zone, Naoto Matsumura survives thanks to the food and water that admiring compatriots send, as they see him like a 'heroe': "Naoto Matsumura is an original person and what he is doing is admirable" declared one of his former neighbours (Ibid).

Maintaining Fukushima's agriculture

Naoto Matsumura's situation is not unique, and a significant portion of the Japanese population is also living in high radioactivity levels without receiving such publicity. In the regions where radioactivity has spread, many farmers are still living and cultivating. A farmer from Nihonmatsu, interviewed in the documentary *Japan: dirty land* (Robin, 2012), explained: "Japanese people have always cultivated in this region and they have got roots in here since many generations. This is why I cannot abandon my land".

A 20-year-old female farmer from Nihonmatsu, added: "We need at least thirty years to decontaminate our land. If we leave, we will not be able to convey the story of this land to young people that build the future." (ibid)

A reason farmers continue to cultivate is that they are backed by Japanese State, which hands out financial compensations provided Fukushima farmers continue to produce. According to the State, there is no immediate danger for cultivating the land and no problem for eating food of the region of Fukushima. Kiyoshi Fujimoto, representative of the Agriculture Minister, said that the radioactivity of the land of Nihonmatsu is "abnormally high, but considering the characteristics of the absorption of caesium by plants, cultivation is not a major problem" (Arte Journal, 2013). In spite of the reassurance of the State, some farmers organized in order to decontaminate the zone. For instance, some started growing colza, famous for its capacity to absorb radioactivity. Some cooperatives were created where customers can verify themselves the level of radioactivity in the products. Despite these reassurance actions, various scandals have alerted consumers, and it became very difficult to sell products from Fukushima. Shinichi Ouchi, a farmer from Nihonmatsu, explained that since the accident, farmers have lost 60 per cent of their business. According to him, "All the product from Fukushima cannot be sold.

6. Interview with researcher Reiko Hasegawa, March 2013, IDDRI Paris

The biggest difficulty is the damage done by the rumours: even though the radiation level is very low, products are not sold" (Belogolova, 2013). Japanese citizens mistrust information given by the State and they organize collectives to measure food safety. As Mitsuhiro Fukao, an economics professor at Keio University in Tokyo, says: "Many Japanese feel they've been lied to by their government" (Glionna, 2012). Thus the only possibility for farmers in Fukushima region to continue to their livelihood is to receive compensation from the State. A significant portion of their production is thrown away as it does not reach/contain the acceptable level of radioactivity. Therefore, although radioactivity in the Fukushima region is "abnormally high" (Arte Journal, 2013), financial assistance from the state tended to encourage the farmer's immobility.

Discriminations towards the 'contaminated people'

Another factor discouraging the mobility of Fukushima residents lies in the discriminations they face in the rest of Japanese society. Researcher Reiko Hasegawa also explains that there is a strong discrimination against people that come from Fukushima.[7] They have no possibility to marry a person that comes from another region, for the assumption that they have bad health: a survey published in February 2013 by the World Health Organization (Larramée de Tannenberg, 2013) said that the risk of developing a thyroid cancer for girls from Fukushima Prefecture is 70 per cent higher than the risk for Japanese population on average. In September 2012, the chairman of Ecosystem Conservation Society Japan Hobun Ikeya, who campaigned against nuclear power, said in a public meeting, that "People from Fukushima should not marry because the deformity rate of their babies will skyrocket" (Haworth, 2013).

Representing the fear of nuclear power, former Fukushima residents that live in other areas of Japan are discriminated in their everyday life. Children at school, for instance, are seen as dangerous by other children (Wallace, 2011). According to The Los Angeles Times (2012), "Apartment dwellers have complained of cooking smells or noises that were unusual only in that they were produced by former Fukushima residents" (Hays, 2013). We can also mention the case of a transportation company in Iwaki (located in Fukushima prefecture) that was asked by its clients "not to use trucks with Iwaki license plates" (Hays, 2013). Discrimination for work application is also frequent as some people have even been asked to give a medical certificate indicating their caesium levels (the caesium rate indicates the presence of radioactivity) (Wallace, 2011).

New divisions among the society

As researcher Reiko Hasegawa highlighted,[8] fear of contamination created may divisions within the Japanese society. Among families, separations between married couples became frequent as the result of strong disagreements about the dangers of radioactivity. The divorce rate has increased and this phenomenon led to a new expression in Japanese language: "genpatsu rikon", meaning "atomic divorce". Noriko Kubota, a professor of clinical psychology at Iwaki Meisei University, also noticed that families are abnormally stressed and that "suicides, alcoholism, gambling and domestic violence across the area" have increased (Haworth, 2013). The "disaster honeymoon period" (Ibid) – i.e. the great cooperation set up just after the accident – ended and people are facing long-term trauma.

Parents feel guilty to stay in Fukushima[9] because they know that radioactivity would have a bad effect

on their children's health. In an article published in *The Guardian* (Haworth, 2013), an interview of a Japanese couple illustrated the dilemma faced by Fukushima parents. Kenji Nomura, living with his wife Aiko in Fukushima Prefecture with their daughters, explained their situation: "We would rather move away from here altogether, but we can't afford it" because "I would have to give up my job" and "it is hard to find a new work in the current economy" (Haworth, 2013). Furthermore, it is socially hard to leave one's job as the colleagues consider it as "desertion" (Ibid).

Family pressures are indeed generally coupled with social pressures. As Aiko Nomura explains, families feel guilty when abandoning their region when there is a strong need of rebuilding it (Ibid). They feel responsible for the disaster, since they voted for the nuclear plant to be created and they feel that they are part of the nuclear disaster (Ibid). In addition, several campaigns came to urge Fukushima residents not to leave the region with slogans such as "Without the revitalization of Fukushima, there is no revitalization of Japan" and "Don't give up Fukushima!" (Hasegawa, 2013). This campaigning is relevant of a more global atmosphere in which reluctance to live in the contaminated areas was quickly described as anti-patriotism or treason.

7. Interview with Reiko Hasegawa, March 2013, IDDRI, Paris

8. Interview with Reiko Hasegawa, March 2013, IDDRI Paris.

9. Ibid

Therefore, because of the insufficiencies of the state responses to the 3/11 catastrophe (in terms of return, immobility or departure) displaced the issue from the institutional level to the individual level, thus creating social conflict and divisions.

CONCLUSION

In 2013, the nuclear evacuees' situation can still be characterized by Reiko Hasegawa's assessment: "evacuees continue to suffer from uncertainties about their immediate future and the affected communities are at risk of disintegration. Reconstruction is still a distant process for the nuclear evacuees" (Hasegawa, 2013). The difficult and perhaps counter-productive decontamination efforts have not reassured the evacuees or the general population that the radiated areas are safer than they were two years ago. Financial compensation remains insufficient and the conditions imposed by the government to favour return are not working as planned.

Tepco's reluctance to fully engage in the reconstruction process contributed to complicating the evacuees' short and long term adaptation strategies. A particular understanding of the term "responsibility" led to the State shouldering the vast majority of reconstruction financing. The nuclear meltdowns were, in part, an industrial disaster and a consequence of the "zero risk" myth that had bypassed basic safety concerns. As a result, the company should have been held accountable proportionally to their responsibility in advocating the "zero risk" myth. As observed in the Greenpeace report, the Japanese government is leading the reconstruction effort with little assistance from the nuclear industry. Nevertheless, the policy of return is largely failing in large part due to its rigidity and the government's negligence in considering migration a viable adaption strategy.

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The New Towns of L'Aquila: A successful post-quake rehousing project or a wrong long-term reconstruction policy?

Lorenzo Pomarico

On 6 April 2009 at 3.32 a.m. an earthquake of magnitude 5.8 struck the city of L'Aquila, located 7 km away from the epicentre, as well as 124 surrounding towns. The death toll was 309 people (Il Secolo XIX, 2013), while 1500 people were injured and about 50000 left homeless in the immediate aftermath of the quake (Repubblica, 2009; Il Corriere, 2009), Most of the people affected came from the city centre. The management of the crisis underscores interesting aspects of reconstruction and rehousing measures.

Interestingly, the government decided to defer the reconstruction of the historical centre of the city and gave instead priority to the C.A.S.E[1] project was comprised of a total of 185 buildings designed to host approximately C.A.S.E, project that was comprised 15,000 people[2]. The project aimed at relocating the displaced population living in the tent camps into newly built anti-seismic apartment blocks before the winter: the so-called New Towns. Four years after the quake, the city is still in ruin, the situation raises a wide range of criticism with regard to the effectiveness of the measures implemented in the aftermath of the quake, their durability, cost and impact on the quality of life of the people relocated.

Firstly, the flats were not meant to be provisional accommodations, but were instead conceived as high-quality flats that would generate a profit on the market in the long term for all the actors involved in their construction. On the other hand, the anti-seismic platforms upon which the buildings were erected turned out to be very expensive devices. These facts coupled with the short time allowed for public tenders and requests for proposals to be carried out considerably raised the whole cost of the project (40% higher than the average market price of the square meter in the country), which amounted to a total of 809 million[3].

Secondly, the amount of money poured into the project and the wide publicity made for and around it in the media contrasted sharply with the ruins of the city centre. This fact actively contributed from fuel the feeling that C.A.S.E was mainly a strategy to divert attention to the fundamental issue of a durable reconstruction of the city centre (whose cost was estimated to be of EUR 10 billion) and raise electoral consensus desperately needed by the ruling government at the time and its Prime Minister Silvio Berlusconi. Furthermore, the local authorities were completely marginalized and excluded from the decision-making phase, which led to a feeling of disempowerment of the inhabitants and the victims of the quake.

Finally, it emerges from media and interviews carried out by the author[4] that the quality of life of the people resettled is actually very poor. The 19 areas of the project are far from the city centre while poor transportation has been set up. No services or social structures have been included in the project, and the New Towns resemble dormitories rather than the lively neighbourhoods they were meant to be.

In light of these elements, we may ask ourselves whether the New Towns are just the incongruous outcome of an ineffective long-term reconstruction policy or yet an incredibly rapid and effective project aimed at rehousing in few months thousands of displaced families while permanently rendering urban areas vulnerable to earthquakes more secure. While the debate still rages in the country and among the public opinion on the final assessment of C.A.S.E project. The most important question has not yet found an answer: will the displaced be able to return?

1. The acronym forms the word "houses" in Italian.
2. Protezione Civile, Numeri del Progetto Case: http://www.protezionecivile.gov.it/cms/view.php?dir_pk=395&cms_pk=15963 ; Accessed on April 26th, 2013
3. Court of Audit of the EU, The response of the SFEU to the 2009 Abruzzo earthquake: pertinence and costs of the operations (in Italian), Special Report n. 24, 2012
4. Phone interview with Carla Tatone, Professor at L'Aquila University and New Town resident, conducted in Paris on April 28, 2013; Phone interview with Giovanna di Carlo, former resident of the city center, conducted in Paris on April 7, 2013. See also Sabina Guzzanti, *Draquila: l'Italia che trema*, 2010 (documentary)

DAM-INDUCED MIGRATION IN THE MEKONG REGION

MARIE LE TEXIER

INTRODUCTION

All four countries comprising the Lower Mekong Basin – Laos , Cambodia, Viet Nam and Thailand – agree that "the social and political economy of resettlement […] is one of the most serious strategic trans-boundary issues facing hydropower development in the area" (ICEM, 2010b: 192). Dam building on the Mekong is indeed at the heart of discussions at the Mekong River Commission (MRC) – the River Basin Organization institutionalized by the 1995 Mekong Agreement to foster cooperation over the shared river of the Mekong—level at present. This is due to the controversial decision of Laos in November 2012 to give the go-ahead to the construction of the Xayaburi dam, against the will of the three downstream riparian States. This dam, which would be the first to be built on the mainstream of the LMB, is indeed expected to bring important transnational socio-environmental consequences, among which important migration flows.

Studies of environmental migration in the Mekong region so far have focused on the linkages between climate change and human migration patterns in the Mekong Delta (Dun, 2009; ICEM, 2009; IOM, UNDP and CTU, 2012). On the other hand, hydropower developments in the region have been extensively studied but not with regards to environmental migration. Rather, the issues covered included security (Goh, 2004; Baker 2012), political-economy (Matthews, 2012), institutions (Ratner 2003; Hirsch et al., 2006), hydro-politics (Keskinen et al., 2008; Schmeier, 2010), common-pool resources (Fox and Sneddon, 2005) and impact assessment (MRC studies principally). This article is therefore an attempt to bring together these two bodies of literature so as to highlight the key features of dam-induced migration in the region. It is, above all, an attempt to raise awareness about this under-researched issue, an awareness that is essential, both at the national and regional levels, if policies are to be adapted to protect these environmental migrants.

1. THE ENVIRONMENTAL CRISIS: HYDROPOWER SURGE IN THE MEKONG RIVER BASIN

1.1. The Mekong River Basin

The Mekong River, which is the tenth largest river in the world and the longest of Southeast Asia, is an international river originating in China and spanning all of the countries of mainland Southeast Asia except mainland Malaysia (MRC, 2005; Cronin and Hamlin, 2012). It is commonly divided between the Lower and the Upper Mekong Basins (LMB & UMB), the latter being comprised of the Chinese and the Burmese parts of the River. This division makes sense both from an hydrological point of view since the Upper Mekong Basin comprises most of the river's descent from over 5,000 metres above sea-level (Baker, 2012), and from an institutional point of view as neither Myanmar nor China have ever accepted to be part of the MRC regime. The present paper focuses on the LMB only, as this is the area of the Basin covered by the MRC mandate, where cooperation and policies strategies may therefore be planned realistically. As far as hydrological cycle is concerned, the most important characteristic to point out, aside from the Southwest monsoon affecting the region, is the special functioning of the Tonle Sap Lake in Cambodia, which fills up and empties in the Mekong according to the seasons. This accounts for most of the extraordinary biodiversity of the river, which is considered to be the second most biologically diverse river following the Amazon. It is, subsequently, essential to the food security

of an estimated 65 million people, whose livelihood is mostly based on fisheries and agriculture. More precisely, it has been estimated that more than 60 per cent of the economically-active population have a job that is vulnerable to changes in the river's hydrology (MRC, 2011). For a long time, the Mekong remained a worldwide example of an untapped, free-flowing river, as no dams had been built on its mainstream (Fox and Sneddon, 2005).

1.2. Projected dams on the mainstream of the Mekong

It was not until 1993 that China completed its first dam on the Upper Mekong mainstream. The 1,500 megawatt Manwan dam was in fact the first of a series of eight planned mainstream dams (cf. Figure 1), known as the Lancang cascaнopğŞde (Goh, 2004). The total planned installed capacity is of about 14,000 megawatts and the cascade is to capture an estimated 40 billion cubic metres of water from the river (about the same amount as the Three Gorges Dam) (Baker, 2012). So far, four of these mega-sized projects have already been constructed (Cronin and Hamlin, 2012). However, none of the 11 planned mainstream LMB dams has been completed yet. Xayaburi, as explained in introduction, is the only project under construction at present. The planned cascade includes eight more dams in Laos and two additional hydropower stations in Cambodia. If these were to be built, 55 per cent of the river between Chiang Saen, Thailand and Kratie, Cambodia would become a reservoir (Baker, 2012). While these plans on the LMB mainstream are quite recent, damming the tributaries of the river, however, is not new on the agendas of the MRC member countries.

1.3. Building dams on the tributaries of the Mekong – power surge in Laos

"Becoming the 'battery of Southeast Asia' through exploiting its hydropower potential has been a longtime dream of the Government of Laos (GoL) and its backers" (Lawrence, 2008: 13). This is why the present paper focuses on Laos when it comes to the study of tributary dams. Laos's "hydroboom" (Ibid.) started in the 1990s with the signing of numerous Memorandums of Understanding (MoUs), both with foreign hydropower developers (23 MoUs signed with Korean, Australian, European and North American corporations) and with the Thai and Viet Namese governments (to export a total of 5000 MW by 2020) (Ibid.). The Asian financial crisis of 1997 ended this race to hydropower, and it was not until the signing of the Nam Theun 2 Purchasing Power Agreement (PPA) in 2005 that foreign hydropower developers rushed back to Laos. This marked the beginning of a new power surge in Laos: it has been estimated that there are currently 16 dams on the Mekong tributaries with nine under construction, another 18 at the planning stage and 29 at the feasibility stage, as shown on Figure 1 (Ministry of Energy and Mines 2013). Christopher G. Baker goes so far as to speak of a "hydropower gold rush" since regional state-owned enterprises from China, Laos and Viet Nam are competing with foreign investors from France, Korea, Japan, and Norway for the hydropower resources of the basin (Baker, 2012: 5).

1.4. The environmental crisis

It is generally acknowledged that a dam has important consequences both upstream of the reservoir, by flooding an important area of the basin, and downstream, by modifying the hydro-morphological regime of the river (both the hydrology and the transport of sediments). The latter type of effects brings about important modifications in the ecosystems of the river, which in turn affect fisheries and agricultural patterns of the basin. In the case of the Mekong, both of these activities are essential to the livelihoods of millions of people in the basin. This is especially exacerbated in two key zones: (1) the Tonle Sap Lake (cf. part 1.1); (2) and the Mekong Delta, which is also known as the "rice bowl of Southeast Asia" and is responsible for half the national rice production of Viet Nam (Lisandre, 2011).

Upstream consequences bring what will hereafter be called direct consequences in terms of migration patterns in the region, i.e. the resettlement of entire villages out of the flooded areas. These population movements are planned, short term and local. Indeed, construction companies, before the actual construction phase of dams, plan and organize the resettlement of the flooded households in areas close to their original villages. On the other hand, downstream consequences are expected to generate long term indirect migration flows, due to the above mentioned modifications in terms of river-based activities. These are expected to be especially important due to the cumulative effects of all tributary and mainstream dams. They are trans-boundary by nature and difficult to predict precisely. That is why the adequate scale of study for such effects is regional and long-term.

2. KEY DAM-INDUCED MIGRATION FLOWS

2.1. Direct consequences of dams on migration flows: resettlement patterns in the Mekong region

Direct dam-induced migration flows may be divided up into two broad categories: (1) out-displacement induced by forced resettlement in the area flooded by a reservoir; and (2) in-migration due to direct job creation in the dam area. In the case of the LMB, it has been evaluated that direct job creation resulting from the 12 planned mainstream dams should generate an estimated USD 7.9 billion in wages (ICEM, 2010: 53). Moreover, it is interesting to note that "much of the labour (especially for skilled and semi-skilled jobs) is likely to be imported from surrounding countries other than the host countries (especially Viet Nam and China)" (Ibid.). This articles focuses however on population movements that followed the resettlement process. Resettlement being a local issue, specific to each dam, the same distinction as in the preceding part, between mainstream and tributary dams, is made here.

Planned mainstream dams

Regarding the planned mainstream dams of the LMB first of all, a strategic environmental assessment (SEA) of hydropower on the Mekong mainstream was carried out in 2010 by the International Centre for Environmental Management (ICEM) for the MRC. The SEA team reviewed existing secondary data sources in the region and estimated to 63,112 the total number of people that would be displaced, should the cascade of 12 mainstream dams be constructed in the LMB. The dams that are expected to account for most of the resettlement are Luang Prabang; Stung Treng and Sambor, as shown in Table 1 below. These figures are probably an underestimate and are expected to rise given more precise data from the developers (ICEM, 2010a).

One of the most problematic issues at stake here is the one of "double jeopardy" (ICEM, 2010a: 111), which designates the fact that some of the villages displaced by mainstream projects have already been forcibly displaced once or twice within the past decade. This is the case of some of the households of Ban Houay Xong, in Nan district, one of the potential districts affected by the Xayaburi dam, for instance: displaced from the uplands to the lowlands in the mid-1990s, these households were forced to relocate themselves seven years after the first displacement, without any governmental support, due to repeated floods in the lowlands (ICEM, 2010a). The main issue resulting from these repeated relocations is the impoverishment of these communities, who have been identified as being among the poorest segments of society (ICEM, 2010b). The ICEM team even stated that frequent forced hydropower-related displacement is "one of the most impoverishing acts that can occur to communities" (ICEM, 2010a: 111).

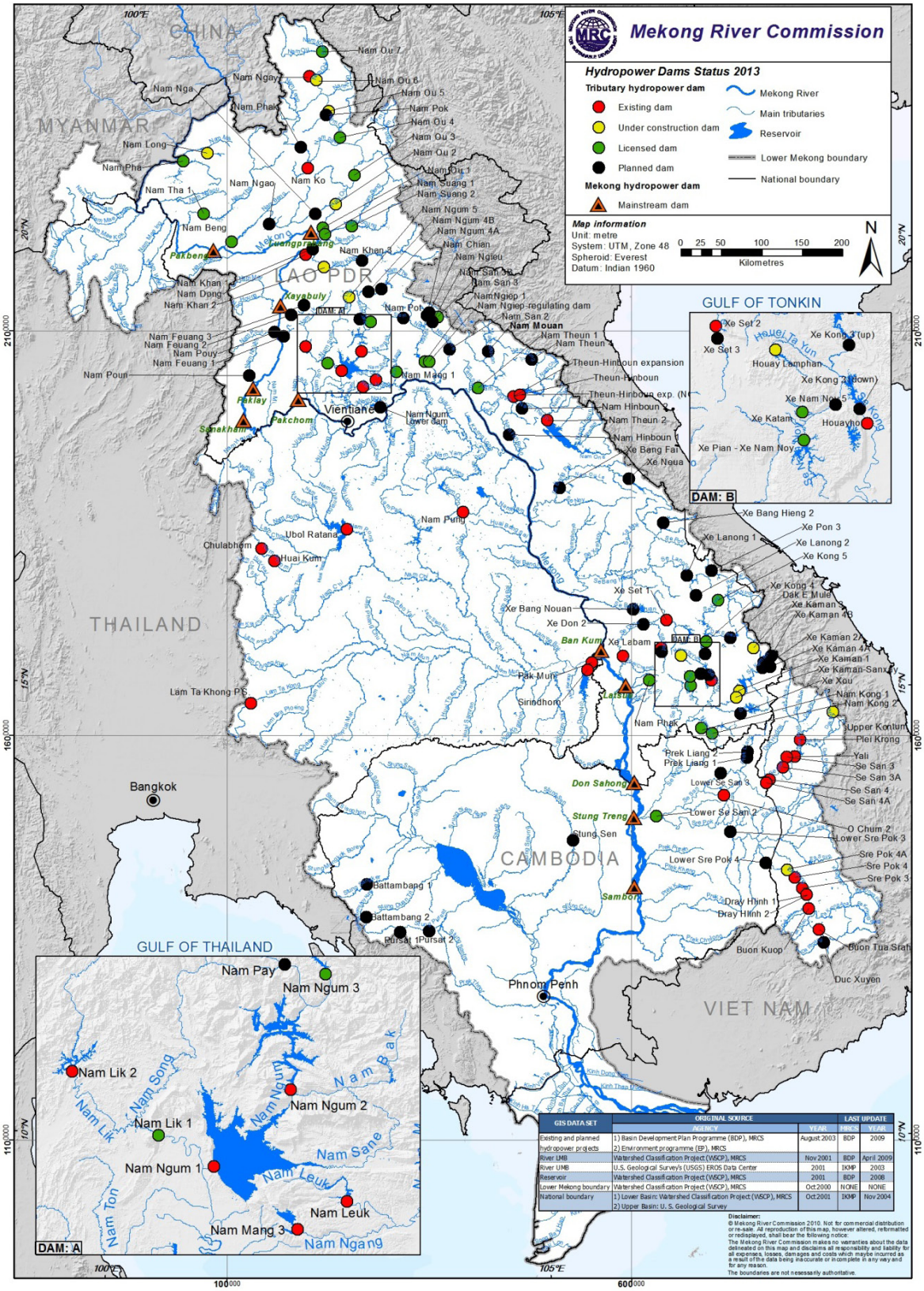
Laos' planned and constructed tributary dams

According to the Hydropower Database of the MRC, the total number of people displaced by Laos' tributary dams is 69,413, with an average of 868 persons displaced per dam. Again these figures are probably an underestimation of the reality, as there are currently no data available for 13 of the Laotian tributary dams. The precise numbers of people displaced per dam are presented in Figure 2 below.

Concerning the evaluation of the resettlement process in Laos, International Rivers, an NGO that protects rivers and defends the rights of communities that depend on them, highlighted some major concerns in an extensive study conducted in 2008. Among these are the facts that lots of ethnic minorities are being resettled and some of them have been resettled more than once already (see double jeopardy issue explained above). There is overall a lack of information disclosure regarding the process and a lack of opportunity for the displaced populations to voice their concerns; and the quality of resettlement programs is rather low (Lawrence, 2008). The micro-level case study of the Theun Hinboun Expansion Project presented below helps to get a more in-depth understanding of the process.

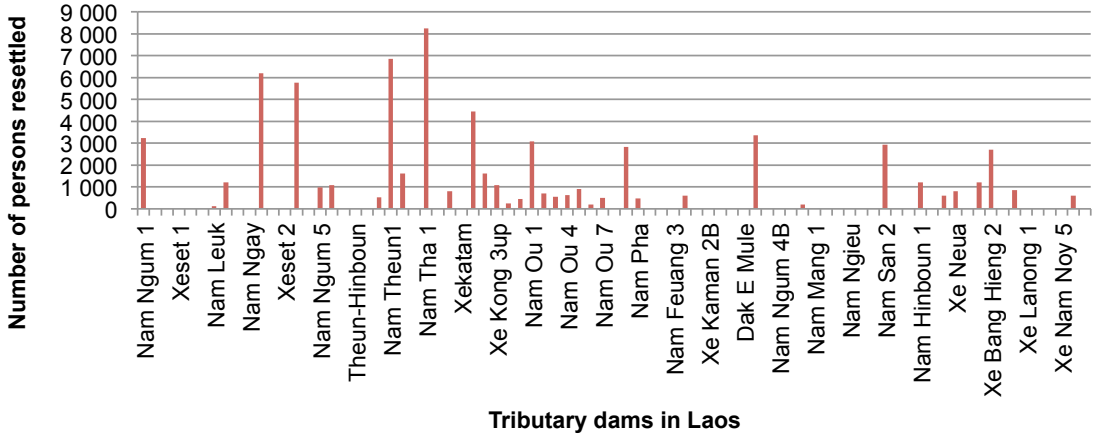
This is a particularly interesting project as it was funded by a national agency (the Theun Hinboun Hydropower Company, which is a consortium of companies in which Electricité du Laos owns 60% of the share) and therefore shows the normal resettlement process in Laos. The project involved building a storage dam on the Nam Gnouang River and doubling the capacity of the existing Theun-Hinboun power plant (Lawrence, 2008: 40). It required the resettlement of approximately 4,000 people (THPC, 2011). The resettlement programme has been evaluated as effective overall (ICEM, 2011), especially since the Theun Hinboun Hydropower Company gave special attention to livelihood development, public involvement, public health and education, and ethnic minorities (THPC, 2011). Despite these efforts, some salient issues have been highlighted, among which: (i) the absence of commitment to provide land-for-land

Map 1. Map of the tributary hydropower dams (circles) either built (red) or under construction (yellow); or licensed (green); or planned (black); and of the mainstream dams (triangles).



Source: MRC Hydropower Database.

Figure 1. Number of people resettled by Laos tributary dams



Note : Only the dams where figures were available have been included (13 additional tributary dams have been constructed). Source: author; with data of the MRC Hydropower database.

compensation (Lawrence, 2008; Matsumotos, 2008; Imhof, 2008); (ii) a lack of productivity of the replacement land for the resettled (Lawrence 2008; Imhof 2008). This is particularly clear in a study of the MK1 project in Phoumarkneng village, a relocation site where five villages merged into one due to the building of the dam (Bénézit et al., 2013). It demonstrated that the resettlement site was subjected to an overexploitation of non-timber forest products resources and of fish resources, while relocated people were generally not self-sufficient in rice and vegetable production. The main explanation accounting for these findings is that the land provided for compensation was of lower quality than the former one.

One of the fiercest criticisms against the THXP resettlement process is the lack of consideration for the downstream communities also impacted (ICEM, 2011; FIVAS, 2007). Indeed, downstream impacts of dams may induce further forced displacement, often not taken into account by the hydropower firms. These impacts are bound to be even more important and to bring even more migration flows, if considered cumulatively.

2.2. Indirect consequences of dams on migration patterns: long-term ecosystem modifications

Causal linkages between dams and long-term forced migration

The MRC has undertaken extensive work on the future socio-economic impacts of dams on the Mekong (ICEM, 2010a, 2010b; MRC, 2010). Our contribution to this work is to reconstruct the causal links potentially leading to forced migration in the future. The results are shown in Figure 3. It is important to note that the diagram only accounts for the operating phase of the dams. The construction phase is bound to have some migratory effects as well, but these are likely to disappear after the 15-20 years of construction. It is also essential to reaffirm the fact that both the tributary and the mainstream dams, constructed and projected, are taken into account in this part since indirect migration flows are most likely to occur due to the cumulative effects of dams.

From the diagram, it appears that the two key push factors of forced migration are the changes in agriculture and in water-related activities, especially in fisheries. Both are directly related to food security, the main triggering factor of dam-induced displacements for Baker (2012: 20), along with water security issues: "Continued LMB hydrodevelopment will result in strong push factors that come from the problems associated with food and water scarcity issues". Water security also appears in our diagram, under the more general category of human health and security issues, as having a significant impact on the decision of affected households to leave.

As for pull factors, the main one is the increase in electricity provision, should the electricity produced by each dam be directly connected to the dam area. In the case of the main regional dam builder – namely Laos – though, most of the electricity produced is sold to Viet Nam, Thailand and China (Hribernik, 2012). This may therefore change electricity generation into a push factor in favor of rural exodus. Still, it has to be noted that electricity exports to neighboring countries will are bound to bring economic development to Laos. Depending on the management of such economic

development, especially whether it is used or not towards dams' areas, the situation might be reverted again and electricity generation turned once more into a pull factor. Assuming that push factors are more important in amplitude than pull factors, the rest of this section focuses on out-migration patterns rather than on those related to new migration into the area.

A key question to answer to, beforehand, is whether or not further migration is likely to occur in the region. The answer seems to be affirmative since increasing proportions of the LMB population have been shown to move across national and international boundaries (ICEM 2010a).

Identification of dam-induced-migration hotspots

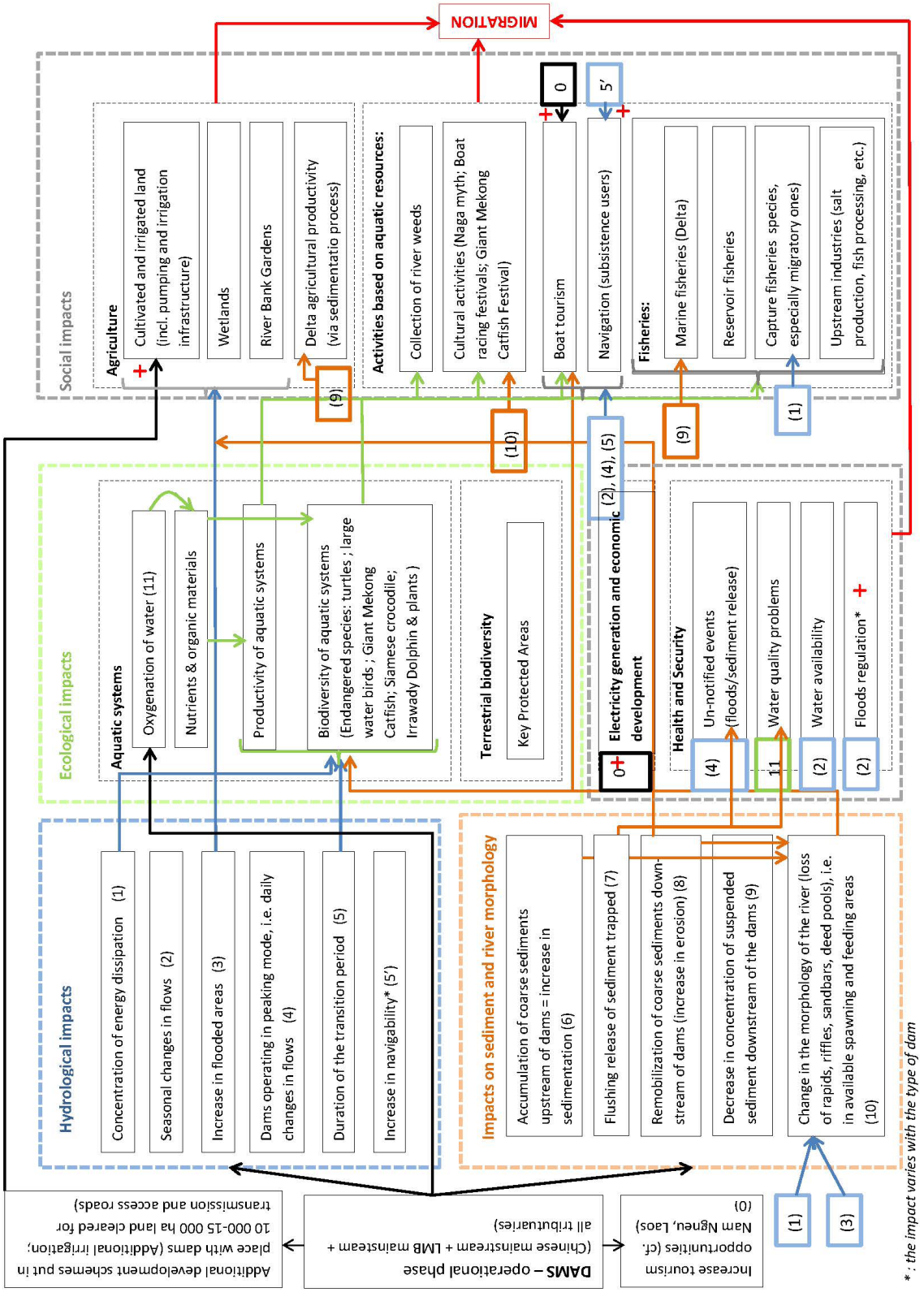
Intuitively, the two zones which are bound to be the most strongly impacted by the different development projects in terms of migration are the Tonle Sap Lake and the Mekong Delta, as the primary fisheries and rice production areas respectively (Baker, 2012). In order to make a more precise assessment of the situation, the assumption is made that the most vulnerable sites are the ones where displacements are the most likely to occur in the long run. Vulnerability, which is defined as "the degree to which a social group is likely to experience negative effects due to exposure to changes in its environment" (MRC, 2010: 14), is a function of "exposure", "sensitivity" and "resilience to change" (MRC, 2010: 14). Exposure is essentially measured by the location of people relatively to the environmental changes, while resilience may be assessed via the existence of alternative livelihoods for affected households. The concept of sensitivity is closely related to the one of dependency on natural resources affected by the changes (Ibid.). For the sake of simplicity, dependency will be considered as a good proxy for sensitivity.

The concept of exposure helps to identify, on top of the Tonle Sap Lake and of the Mekong Delta, two additional highly vulnerable sites (Hall and Bouapao, 2010; MRC, 2010): (i) the Siphandone stretch of the Mekong (Southern Laos), in an important fishing migration area prone to extensive dam building; and (ii) the Chiang Rai area, given that in the northern Thailand all the rivers are still connected to the Mekong and therefore likely to be highly impacted by any dam-induced changes. The MRC vulnerability assessment of the basin (Hall and Bouapao, 2010) then goes one step further and shows that the Tonle Sap area is the most vulnerable zone, followed by the Siphandone zone. The Thai side of the mainstream and the Mekong Delta to a lesser extent are less vulnerable to development plans. How can this classification be justified?

The study of the four respective national economic contexts provides for a first baseline vulnerability assessment of the region. Indeed, it has been proved that "resource users living in supportive environments (with strong economic links, well-developed infrastructure and social services) would be less vulnerable to changes in water resources availability than those living in less supportive environments" (Hall and Bouapao, 2010: 4). Laos and Cambodia both face multiple challenges in providing a supportive environment for their respective populations, contrary to Thailand and Viet Nam which both offer satisfying economic growth and access to basic services to their populations (Hall and Bouapao 2010; MRC 2010). Therefore, the Tonle Sap and the Siphandone areas are likely to be more vulnerable to changes in water resources than the Mekong Delta and the Chiang Rai area

The concepts of dependency and resilience, taken together as they are closely related, allow to go one step further in the classification. The results of interviews carried out during the MRC vulnerability study (Hall and Bouapao, 2010) in the four above mentioned areas show that nearly 33 per cent of the Cambodian households, when asked what their second most important livelihood occupation was, answered that they had none, contrary to Laotians households, 57 per cent of whom answered "fishing". Full-time fishers are rare in Laos, where the primary economic activity is agriculture (MRC, 2010). These findings show a very high level of vulnerability of the Cambodian households near the Tonle Sap Lake as they have no livelihood alternative, should their primary occupation – fishing – be threatened. The Tonle Sap area is thus more vulnerable than the Siphandone zone. The dependency of households on fish, as shown in Table 2 below, further confirms this pattern. It also enables to classify Thailand and Viet Nam's studied areas: with twice as many people being highly dependent on fish and other aquatic animals as compared to Chang Rai, the Mekong Delta is more vulnerable to any change in the river.

Figure 2. Causal linkages between dams and human migration flows.



Note: If there is no "+" red sign indicated, the impacts are assumed to be are negative. Source: Author.

Table 1. Assessment of household's dependence on fish and other aquatic animals by study site

Level of dependence	Cambodia study sites	Lao PDR study sites	Thailand study sites	Viet Nam study sites
Low	21%	17%	45%	59%
Medium	42%	68%	45%	29%
High	22%	14%	8%	9%
Very high	15%	1%	2%	4%

Source: Hall and Bouapao, 2010: 126

Concerning the distributional impacts of dams, or what may be called the *social hotspots* of migration, most studies agree that the impacts "related to the loss of agricultural land (…), off-shore fisheries and flood plain agriculture (…), are likely to fall more heavily on poorer groups" (ICEM, 2010a : 60). This finding is further confirmed by the fact that the poorest segment of the population in the basin is much more dependent on fisheries for their livelihoods than higher income groups: in Cambodia for instance, "75 per cent of the poorest quintile catch fish (and seafood) as part of their livelihood compared to only 17 per cent of the richest segment" (MRC, 2010: 40).

Main destinations for the migrants

Two main types of migration in the LMB have been identified (ICEM, 2010a; Baker, 2012): (i) rural to urban migration; and (ii) migration to Thailand from neighboring countries, especially from Laos and Cambodia. Consequently, a probable destination for the farmers and fishermen from the Tonle Sap Lake and the Siphandone area might be the main migrants' receiving cities in Thailand, namely Bangkok and to a lesser extent Chang Mai (Promburom and Sakdapolrak, 2012; Baker, 2012). Nonetheless, international migration is not the migrants' first choice, and "rural-urban migrants usually move within their own country before moving across borders" (Baker, 2012: 22).

Within Viet Nam, first of all, there has been an increase in rural-urban migration since the mid-1990s (Viet Khoa et al., 2012). Among the main in-migration cities are: Ho Chi Minh City, Ha Noi, Hai Phong and Da Nang (Ibid.). Regarding the Mekong Delta more specifically, "trends continue to show movement of migrants from the rural Mekong Delta towards urban centres, industrial parks and rapidly developing high-growth provinces in the Southeast and Central Highlands of Viet Nam" (Dun, 2009: 9). As far as Thailand is concerned, rural-urban migration has increased since the 1960s, with Bangkok being the main destination (Promburom and Sakdapolrak, 2012) along with Chiang Mai. As for Laos, the main receiving area is Vientiane Capital followed by Borikhamxay, Vientiane, Luangnamtha and Bokeo provinces (Kabmanivanh Phouxay, 2010). It appears, however, that most of the people arriving to these places come from northern provinces, while the majority of the migrants originating from southern provinces are more likely to move to Thailand than to Vientiane (Ibid.). Thus the majority of migrants coming from the Siphandone area would likely go to Thailand receiving urban centers. Finally, when it comes to Cambodia, it has been assessed that migration flows are essentially rural-to-rural (Maltoni, 2007). Rural-urban migration, even though less important, still exists with the main urban centers of in-migration being Phnom Penh, Koh Kong, Battambang, Siem Reap, and Banteay Meachey (MRC, 2010). Moreover, internal migration is rather short-range (Maltoni, 2007), and when inter-province migration occurs, this is from "the more densely populated provinces in the south and west to the more sparsely populated provinces in the north-east" (MRC, 2010: 33). All in all, it seems that the population from villages around the Tonle Sap would migrate primarily towards other villages in close and sparsely populated provinces, before moving to the above-mentioned urban destinations.

Concerning the amplitude of these potential migration flows, Baker (2012) identifies three potential scenarios (cf. Figure 4). The policy implications of these different scenarios are incremental and vary from the mere need of policies tackling unemployment and inflation increase in receiving areas in the first scenario to the necessary resort to international aid in the third case (Ibid.).

3. MAIN GAPS IN POLICY RESPONSE BOTH AT THE NATIONAL AND REGIONAL LEVELS

3.1. Lack of protection of resettled people in the national legal and policy frameworks

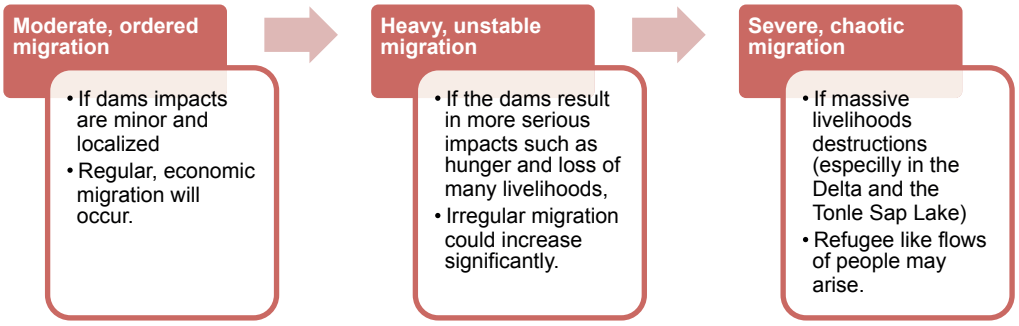
Preliminary assessment of the LMB countries' respective resettlement frameworks

"Numerous gaps remain in land acquisition and compensation policy and procedure compared to international best practice for all LMB countries" (ICEM 2010b: 192). Lack of political will and human capacities have been identified as other obstacles to a socially equitable resettlement practice (Ibid.).

The main issues include:

- Inadequacy of the overall Environmental and Social Impact Assessment (EIA) process (ICEM,

Figure 3. Three potential migration scenarios



2010a: 106): in Cambodia for instance, a clear "lack of political commitment for the role of EIAs in development decision-making" has been identified, along with a lack of capacity within the Ministry of Environment to critically review the EIA findings (Suhardiman, de Silva and Carew-Reid, 2011: 93);

- Limits of national capacities to implement the respective national social and environmental guidelines, especially on hydropower planning and monitoring (ICEM, 2010a);
- Insufficiency of budget funds allocated by hydropower developers to social and environmental safeguards (ICEM 2010a);
- Barrier of land management to a sound resettlement management: as most rural lands do not have any legal title, rural communities are often in a weak bargaining position vis-à-vis hydropower developers' interest in terms of land concession (Ibid.; ICEM, 2010a: 106);
- "Legal pluralism" (Suhardiman, de Silva and Carew-Reid, 2011: 131), whereby hydropower development is managed by different government agencies operating in more than one legal order (Ibid);
- Lack of public participation in hydropower decision-making: public participation, if any, mainly occurs at the project level regarding mere procedural matters (Suhardiman, de Silva and Carew-Reid, 2011).

Focus on Laos's hydropower legal and institutional framework

An extensive legal and policy framework in Laos has been developed, especially over the last decade, on environmental and water management. Moreover, "in the lead-up to Nam Theun 2's approval, the World Bank, the ADB and other donors worked with the GoL to establish social and environmental laws and policies to guide hydropower development in the country" (Lawrence, 2008: 18). These different documents include provisions to ensure participation of local populations and livelihood improvement for resettled communities – rather than mere monetary compensation – with special attention being given to ethnic minorities (Nam Theun 2 Project, 2005). In practice however, these provisions are either not enforced or implemented on an ad hoc basis (Lawrence 2008).

A thorough analysis of the legal and institutional frameworks of the different sectors related to hydropower – namely the water, land, environment, energy and resettlement sectors – is necessary to provide an explanation for such a gap between these legal and institutional frameworks and the reality on the ground. Such an analysis has been completed by Suhardiman, de Silva and Carew-Reid (2011), the results of which are summarized in Chart 3 below. In a nutshell, it appears that the current legal framework is giving too much responsibility to project owners regarding the resettlement process, while the main regulatory bodies over land and water resources lack authority to effectively monitor the hydropower projects. This is explained by the underlying rationale of the GoL who is encouraging private investment in the country to boost its economy.

As far as the hydropower decision making process is concerned, it seems that the Ministry of Environment and Mines (MEM) bases its decision to undertake the building of a dam essentially on the project's economic feasibility. The EIA has to be approved as well but only by the Water Resources and Environmental Administration (WREA), which in practice has less bureaucratic power than the MEM. Another issue is the one of the discrepancy between the respective positions of national level and provincial level authorities regarding resettlement and compensation issues. This is an important obstacle to a sound resettlement practice since each power company, after having obtained the national authorities' approval for their respective projects, has to negotiate again with provincial authorities about the resettlement issue at the

implementation phase of the project. The main explanation for such an inconsistency between national and provincial level authorities is the absence of a "connected multi-level regulatory system" (Suhardiman, de Silva and Carew-Reid, 2011: 42) in the hydropower development sector.

3.2. Lack of awareness and authority to deal with indirect long-term migratory consequences of dams at the MRC level

Contrary to the issue of resettlement in the flooded area, which is local, indirect migration flows arise from the cumulative effect of all tributary and mainstream dams. As such, they are a transboundary issue by nature, which should therefore be addressed at the MRC level. Currently, there is no clear framework for dealing with such transboundary issues, as "they raise issues of accountability that none of the LMB countries have previously had to address" (ICEM, 2010b: 199).

A lack of awareness?

The main obstacle to the establishment of such a framework is the lack of awareness of such issues on the part of the MRC. Although the MRC framework also presents the issue of social consequences of dams in terms of direct and indirect impacts – referring respectively to losses of livelihood resources and to the remaining impacts such as new employment opportunities, cumulative loss of livelihood related activities, health risks and water pollution – it does not encompass the issue of population movements (ICEM, 2010a).

But rather than a lack of awareness as such, it would be more accurate to speak of a restricted mandate of the MRC. Indeed, employees of the MRC Secretariat are well-aware of the migration issue. The main reason why the latter is not discussed officially is that it is not part of the official MRC agenda. The MRC is indeed focusing on water-related issues in a narrower sense. For the issue of migration to be included in the MRC mandate, there needs to be a consensus and a collective request from the four member States. This is unlikely to happen given the current regional setting, but even if it were the case, the question remains of what the MRC could potentially do.

A lack of supra-national power

Given the current practices of the MRC when faced with other social effects of dams in the region (Hall and Bouapao, 2010), it is probable that the institution would adopt a mitigation strategy towards migration flows. In a sense, it is already doing it indirectly, through the mitigation of other effects of dams: by limiting the impacts of dams on fish migration and sediment transport for instance, the MRC is indirectly helping in diminishing human migration flows.

Another key area where the MRC could potentially act is by extending its data and knowledge on the subject. In reality, "the use of knowledge to make better decisions is at the heart of the MRC's governance role (…). Producing scientific knowledge (…) is both its unique strength and an essential foundation for providing disinterested scientific advice to governments, international institutions, project developers and (…) other river Basin stakeholders" (Hirsch et al., 2006: 120-130). The MRC programme the most closely related to social sciences is the Basin Development Plan, which aims at ensuring that the use of the Basin's natural resources contributes to sustainable economic development. Currently dealing with issues such as employment and food security, it might easily encompass migration as well.

The real impact of such actions remains to be seen, as the MRC has no supra-national authority over its member States. It is and remains an inter-State body with no supra-national authority (Cronin and Hamlin, 2012), a governed organization rather than a governing one (Hirsch et al., 2006). Many observers – especially civil society groups – consider this as one of the main MRC's weaknesses and expect it to "intervene in its own right to address concerns or resolve grievances" (Lee and Scurrah, 2009: 20). Furthermore, the MRC also lacks the power to influence the four LMB countries' respective policies: considering the sensitivity of water-related issues, there is little if no chance that the MRC may influence in any way the respective national migration policies of its member States or the signing of a multilateral migration agreement between them.

Even though the MRC did have such a power, the outcomes of such discussions would likely be threatened by two external actors. Firstly, China, a non-member of the MRC, is building eight mainstream dams on the upper reach of the Mekong where the MRC has no authority whatsoever. As one of the main investors in the new waves of dams in Laos, the country is also pushing for rapid hydropower development in the LMB with little concern over socio-environmental issues. The prospects of improvement of the situation are rather pessimistic since China, as both an upstream riparian (able to reap all the benefits of increased hydropower and export most of the social and environmental consequences) and the economic leader of the region, is not likely to accept to become part

Table 2. Summary of the assessment of the existing legal and institutional hydropower framework in Lao PDR.

Sector	Main legal texts	Main issues impeding sound resettlement practices
Resettlement Legal and Policy framework	Decree on Compensation and Resettlement of People Affected by Development Projects (STEA, 2006); Regulations for Implementing Decree on Compensation and Resettlement of People Affected by Development Projects (2006)	This legal framework gives project owners the full responsibility to conduct the overall resettlement process. The main problem is therefore one of conflict of interests. This is especially problematic given that there is currently no clear definition of any mechanism in place to monitor the projects' owners conduct.
Energy Legal and Policy framework	Electricity Law (1997, 2010); Power System Development Plan (2004); National Policy on Sustainable Hydropower (2006); Renewable Energy ; Development Strategy (2010)	The rationale of the GoL is to encourage private sector investment in hydropower development to promote economic growth. This is the main reason why the rationale to regulate or plan is most often side-lined, and why the resettlement framework gives so much responsibility to the project's owner.
Water management Legal and Policy framework	Water and Water Resources Law (1996); National Water Resources Profile (2008) Draft National Water Resources Policy (2010)	The analysis of this sector may provide an explanation for the difficulty to monitor hydropower projects. Indeed, the different texts define a regulatory body (WREA) in charge of regulating the different water related activities. Yet, it is also clear from these texts that this body lacks the authority to effectively monitor the different hydropower projects. In practice, there is a clear lack of inter-ministerial/cross-sectoral coordination, resulting in unclear operational boundaries and as a consequence to a "institutional and responsibility vacuum".
Land management Legal and Policy framework	Land Law (2003); Decree on state land lease or concession (2009); Instruction as regards the implementation of decree on state owned land approval for lease or concession (2010)	The same is true for the land sector where the main regulatory body (NLMA) has no authority over the different ministries. Another important issue which may impede sound resettlement is the fact that "the law does not oblige land registration for small scale land use (article 45). Being not formally registered as official land users, they might receive lower compensation and lack any legal back up to negotiate about their lost opportunities in land use with the respective project staff" (p. 24).
Environment protection Legal and Policy framework	Environment Protection Law (1999); Decree on the agreement and endorsement of the National Strategy on Environment years 2020 and Action Plan for the years 2006-2010 (2004); Decree on Environmental Impact Assessment (2010)	The main issue outlined by the analysis of these texts is the one of public participation: mechanisms for public participation remain limited, especially in the EIA process.

Source: Author, with data from Suhardiman, de Silva and Carew Reid (2011).

of the cooperation regime (Menniken, 2007). The second external actor potentially at odds with any cooperation improvements in trans-boundary migration management is the Greater Mekong Subregion (GMS) programme, initiated in 1992 by the ADB. "The GMS Program focuses on economic and infrastructure development, (…) and largely ignore(s) the Mekong River and aquatic biodiversity aspects" (Keskinen et al,. 2008: 85). Part of its portfolio of activities is the GMS Energy Roadmap, which explicitly aims at implementing an integrated approach to deliver sustainable energy, in particular through hydropower development (ADB 2013). If the MRC and the GMS continue to compete rather than to cooperate (Keskinen, 2008), this may directly go against any policy improvement on the part of the four member States.

A need to transfer the resolution of dam-induced migration issues to other regional bodies

To avoid a potential political dead-end, a realistic option may be to transfer the resolution of dam-induced migration issues to other regional bodies, such as the ASEAN and the ADB's GMS. The ASEAN, firstly, represents the right political level of discussion. Regional migration policies are already being discussed at this level, especially regarding the implementation of a common visa for ASEAN citizens similarly to the Schengen visa in Europe. Moreover, some observers have advocated for the incorporation of security-oriented regional water issues to the higher political level of ASEAN: "A shifting of the politicized and securitized part of the Mekong issue to genuine

political bodies such as ASEAN, or to economically powerful institutions such as the ADB and GMS, in order to combine water-related with other issues could help to outweigh China's 'Rambo' position in the water field" (Menniken, 2007: 112). The GMS, on the other hand, might be the adequate body for the funding of such regional migration mechanisms. There is a lot to be done before getting there however, for the MRC has not taken part in the "extraordinary momentum towards regionalism that swirls around it" so far (Hirsch et al 2006: 67).

If dam-induced displacements could be introduced on the ASEAN agenda, what should be the position advocated by the MRC? Should it stick to a mitigation point of view, as mentioned earlier? Or should it rather adopt, along with mitigation, an adaptation vision of migration? Given the unavoidable impacts of dams already constructed or about to be, the latter option seems to be the more appropriate one. It is essential to consider migration as part of the solution to the problem. In the same way as foreign migrants are considered as cheap workforce for the construction of dams, dam-induced migrants may become resourceful agents in the receiving areas, if migration is well-managed. Contrary to Baker's vision on the security implications of migration, migration may well represent an improvement of human security rather than a threat to it.

4. CONCLUSION AND POLICY RECOMMENDATIONS

Dam building on the Mekong brings both direct migratory consequences, by resettling important numbers of people located in the areas flooded by the reservoir of each dam, and indirect migration flows due to the cumulative effects of tributary and mainstream dams on water-related activities – especially fisheries and agriculture. The former type of impacts is insufficiently addressed at the policy level of each LMB country. In Laos in particular, which aims to become the "battery of South-East Asia", the existing legal and institutional framework presents significant weaknesses in protection resettled populations. As for indirect consequences, they are trans-boundary by nature, and as such should first be addressed at the regional level. If the MRC is the most evident arena for such an issue, it has been shown that the organization might gain momentum in seeking alliances with the ADB's GMS programme as well as with the ASEAN forum. More precisely, our main recommendations would be:

- Governments should "treat resettlement not as a problem but as an opportunity. One key element in this is to mix land-based and diversified strategies, not just to restore people's incomes but to improve them" (World Bank, 2000).
- More resources ought to be invested in the implementation of sound resettlement policies, especially by international funding agencies such as the World Bank or the ADB.
- The MRC should adopt a radical change of paradigm and include adaptation options along with mitigation strategies of dams' social and environmental effects.
- The migration issue should be included to the MRC mandate. This would enable the extension of data and knowledge on water-related migration through the BDP programme of the MRC.
- Cooperation between the MRC and the other powerful regional bodies should be enhanced: the ASEAN may be an indirect way for the MRC to tackle the issue of dam-induced migration while the ADB and its GMS could provide a non-negligible source of funding of such migratory governance mechanisms.

Only a few authors have already acknowledged the true scale of the dam-induced migration issue in the Mekong region. Baker (2012: 23) is one of them: "impacts [of the Mekong dams] on food security and livelihoods threaten to create a situation where migration [...] leads to even greater pressures on populations and states". This article attempts to swirl around this momentum and, hopefully, to further it.

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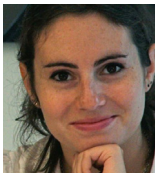

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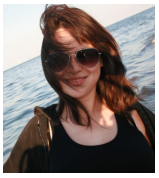
Geraldine Zambrana



Geraldine Zambrana is from Bolivia. After a Fine Arts school in Bolivia, she did her B.A. at Sciences Po Poitiers campus and specialized in Latin America She then joined the Master's in Human Rights and Humanitarian Action programme and specialized in Project Management and Migration (PSIA/Sciences Po). So far, her work experiences in the field of development include Public Partnerships Assistant in a microfinance NGO in Paris; Public Relations Manager in a cultural association in Johannesburg; and Project Manager at a shelter for children in New Delhi. She aims to keep developing her skills in the Project Management field.

The State of Environmental Migration 2013

A REVIEW OF 2012

Edited by
François Gemenne
Pauline Brücker
Dina Ionesco

This volume is the third of an annual series, which aims to provide the reader with regularly-updated assessments on the changing nature and dynamics of environmental migration throughout the world. The idea for it stemmed from the course "Environment and Migration", taught at the Paris School of International Affairs (PSIA) of Sciences Po. The course, which is thought to be the first of its kind in the world, examines the complex relationship between environmental change and migration flows. The best of these papers have been selected and edited, and are presented in this volume. Most of them constitute the first detailed analyses of the migration flows that were induced by some of the most dramatic events of 2012, paving the way for future scholarly works.

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