



**HUMAN MOBILITY AND CLIMATE
CHANGE ADAPTATION POLICY:
A REVIEW OF MIGRATION IN
NATIONAL ADAPTATION
PROGRAMMES OF ACTION
(NAPAs)**

**Jon Sward (University of Sussex) and Samuel
Codjoe (University of Ghana)**

Migrating out of Poverty
Research Programme Consortium
Working Paper 6
March 2012

The UK Department for International Development (DFID) supports policies, programmes and projects to promote poverty reduction globally. DFID provided funds for this study as part of that goal but the views and opinions expressed are those of the author(s) alone.

Migrating out of Poverty
University of Sussex, Arts B
Brighton BN1 9QN, United Kingdom
Email: migrationrpc@sussex.ac.uk
Web: <http://migratingoutofpoverty.org>
Twitter: @MigrationRPC
Facebook: /migratingoutofpoverty
Blogger: migratingoutofpoverty.blogspot.co.uk

This is an output from a project funded by UK aid from the UK government. The views expressed do not necessarily reflect the UK government's official policies.

© 2012 University of Sussex, School of Global Studies. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Table of Contents

List of Abbreviations	4
Executive summary	5
1. Introduction: climate change adaptation and migration	7
1.1 Climate change adaptation in Least Developed Countries: the significance of NAPAs ...	8
1.2 Migration and climate change: uncertainties about flows and severity of impacts	10
1.3 Migration and NAPAs: an overview of the review methodology	13
2. General findings: migration in NAPAs.....	14
2.1 NAPAs with ‘substantial’ discussion of migration: mobility as a key variable in the adaption challenge	15
2.2 NAPAs with ‘moderate’ discussion of migration: accounting for mobility in adaptation strategies	18
2.3 Countries with ‘minimal’ discussion of migration: little consideration of the impact of mobility on adaptation	20
3. Policy overview: migration in NAPA priority projects	21
3.1 Policies on ‘coping strategies’: limiting rural exodus and transhumance	23
3.2 Policies on resettlement and displacement.....	25
3.3 Policies on the ‘negative impacts’ of climate-related migration.....	26
3.4 Beyond climate migration: policies on conflict-driven migration and NAPAs which ignore migration issues	26
4. Case study: migration and adaptation in West Africa	26
4.1 Migration and climate change: the West African context	27
4.2 Theme one: increased transhumance and rural exodus in response to drought ...	28
4.3 Theme two: sea-level rise, flooding and population displacement	29
4.4 Theme three: negative impacts associated with migration	30
4.5 Gaps in the migration discussion in West African NAPAs	30
5. Policy implications	31
6. References.....	33
7. Appendix: Full Review Results	43

List of Abbreviations

CIFs	Climate Investment Funds
COP	Conference of Parties to the UNFCCC
DWCPs	Decent Work Country Programmes
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IDPs	Internally Displaced Persons
IPCC	Intergovernmental Panel on Climate Change
LDCs	Least Developed Countries
LDCF	Least Developed Countries Fund
LEG	Least Developed Country Expert Group
Migration RPC	Migrating out of Poverty Research Programme Consortium
NAPAs	National Adaptation Programmes of Action
PICs	Pacific Island Countries
PRSPs	Poverty Reduction Strategy Papers
UN CDP	United Nations Committee for Development Policy
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

Executive summary

In recent years, a number of reports have suggested that climate change will result in new waves of human migration, as people leave areas affected by sea-level rise, flooding, drought and other projected climate change impacts (Action Aid International, 2007; Christian Aid, 2007; Conisbee and Simms, 2003; Renaud, et al., 2007; Stern, 2007; Warner, et al., 2009). For example, the Stern Review (2007) suggested that 150-200 million people could be displaced by climate change by 2050. However, the relationship between climate change and migration is complex, and the available evidence shows that people make pragmatic, disaster-specific choices about where best to move in the face of environmental disasters (Naik, 2009: 273). These decisions are themselves mediated by a range of 'intervening factors' that either facilitate or constrain migration, including ease of transport, access to social networks and government policies that restrict or encourage migration (Black *et al*, 2011: 432). While there is some evidence to indicate that people move in response to climate events, in the context of low-income countries this often consists of short-distance, internal migration rather than overseas migration.

Despite increasing awareness of the complex linkages between migration and climate change, there is limited analysis on how issues of human mobility are currently addressed in national climate change adaptation strategies. In response to this, the Migrating out of Poverty RPC conducted a comprehensive review of how migration is discussed in National Adaptation Programmes of Actions (NAPAs), which are national adaptation plans developed by Least Developed Countries (LDCs). NAPAs are intended to provide LDCs with an opportunity to create country-driven adaptation strategies that address immediate adaptation needs. Many LDCs face comparatively difficult challenges in adapting to climate change, as by definition they have severe structural impediments to growth including low per capita income, low levels of human capital and high levels of economic vulnerability.

The Migrating out of Poverty RPC's review of NAPAs investigated that ways in which these policy documents discuss a range of migration-related issues including drought-induced migration, rural exodus, transhumance, refugees, population displacement, resettlement, and other issues. Each policy document was searched for key migration-related terminology, and subsequent analysis was done in order to clarify the context in which each of these terms was mentioned. The results of the review, which are presented in detail in this working paper, showed that consideration of migration issues varied widely across countries' NAPAs. While some countries discussed in-depth the way that various types of migration were relevant to their national adaptation challenges, other countries scarcely accounted for migration issues in their NAPAs.

From a policy perspective, to the extent that autonomous migration is mentioned at all in NAPAs' proposed adaptation projects – which are termed 'priority projects' – it is typically viewed as impacting negatively on adaptation. While 13 NAPAs refer to rural exodus and nine refer to transhumance in their priority projects, these policy often involve investing in projects which will function in part to stop migration flows. Meanwhile, 14 countries introduce policies related to resettlement or population displacement, illustrating the perceived importance of protecting vulnerable communities in many NAPAs. Additionally, a number of proposed NAPA priority projects emphasise the perceived negative impacts of migration: three NAPAs view migration as barrier to proposed priority projects; two NAPAs

attempt to resolve migration's detrimental impact on the provision of services in their priority projects; and one refers to conflict-driven migration. Tellingly, 13 NAPAs do not discuss migration issues in their proposed adaptation projects at all.

This working paper also includes a case study on NAPAs from West Africa, which was selected because there are a relatively large number of NAPAs that have been produced by LDCs from this region (10) and there is a long history of regional migration due to environmental and other factors. The case study highlights three themes commonly discussed across NAPAs from this region: (1) migration that is already occurring in response to recent droughts in West Africa; (2) the present and future threat posed to communities by sea-level rise and flooding; and (3) the perceived negative impacts of migration, such as conflict over land, environmental degradation, and pressure on urban areas. Gaps in the discussion of migration and environmental change in West African NAPAs are also identified by the case study.

The working paper concludes with policy lessons that emerged from the Migrating out of Poverty RPC's review of migration in NAPAs. While policymakers often emphasize the negative impacts of migration in low-income countries, especially rural-urban migration, there is evidence that such flows can play an important role in building adaptive capacity to climate change, for example by diversifying rural household income sources and leading to positive development impacts. While adaptation policies are needed in rural areas, such policies cannot be expected to stop rural-urban migration. Indeed, attempts to halt rural-urban flows by investing in rural areas – a common policy approach in many low-income and middle-income countries – have generally failed in all but the short term. Rather than attempting to stop these flows, more focus needs to be put on integrating urban planning in national adaptation strategies. Related to this, migration must be seen not only as a failure of development or adaptation, but as potentially contributing to livelihood strategies in low-income countries. Such an approach would focus attention on the vulnerabilities of livelihoods to climate change, and highlight the potential benefits and risks that migration brings in the context of on-going environmental change.

1. Introduction: climate change adaptation and migration

Although there has been increased discussion and debate in recent years in both academic and policy circles concerning the impact of climate change on human migration, little attention has been focused on how existing climate change policies discuss migration. This paper attempts to partly address this research gap by outlining the findings of the Migration RPC's comprehensive review of migration in National Adaptation Programmes of Action (NAPAs), the national climate change adaptation plans for Least Developed Countries (LDCs). The Migration RPC's study provides the most comprehensive review of the discussion of migration in NAPAs to date, including an in-depth look at how NAPAs discuss a wide range of migration-related issues including drought-induced migration, rural exodus, transhumance and refugees, as well as displacement and resettlement, among other topics. The review found that discussion of migration issues varies widely across different countries' NAPAs, with some countries undertaking in-depth discussions of the relationship between migration and climate change while others scarcely consider the topic relevant to their national adaptation strategies. Where NAPAs discuss migration, they are typically concerned with internal migration, as opposed to international migratory flows – unlike other types of policy documents such as Poverty Reduction Strategy Papers (PRSPs) (Black and Sward, 2009) and Decent Work Country Programmes (DWCPs) (Deshingkar, et al., 2012) which mainly discuss international migratory flows. From a policy perspective, most LDCs retain a negative view of migration, as their proposed policies often seek to halt or reduce autonomous forms of migration, especially rural exodus.

LDCs by definition are low-income countries with weak human assets and high levels of economic vulnerability¹. NAPAs provide an opportunity for LDCs to produce country-driven plans that identify priority activities to address immediate climate change adaptation needs (UNFCCC, 2011). NAPAs, which are funded through the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat, thus have a potentially pivotal role to play in launching coordinated climate change adaptation efforts in LDCs. This is acutely important because although LDCs have played a negligible role in contributing to the greenhouse gas emissions that are the primary cause of anthropogenic climate change, their inhabitants are nevertheless highly vulnerable to the impacts of climate change given the relatively weak baseline capacity for adaptation that exists in most LDCs.

LDCs are primarily concentrated in Sub-Saharan Africa and thus the majority of NAPAs produced to date have been created by states in this region. In fact, by the end of 2010, 45 countries had submitted NAPAs to the UNFCCC Secretariat and 29 of these countries were in Sub-Saharan Africa². Thus, to a large extent the Migration RPC's review of migration in NAPAs involved examining the ways in which Sub-Saharan African countries account for migration in their NAPAs, owing to the relatively large number of NAPAs that have been

¹ Least Developed Countries are determined by several criteria, including gross national income per capita, the Human Asset Index and the Economic Vulnerability Index – with each of the latter two combining a range of indicators. Additionally, only countries with 75 million inhabitants or fewer can be classified as LDCs (UN CDP, 2008).

² This figure includes African island nations that are designated as part of Sub-Saharan Africa by the UN, including Sao Tome and Principe, Comoros, Cape Verde and Madagascar.

produced by countries in this region. Two North African countries have also submitted NAPAs, along with seven Asian LDCs, five Pacific Island Countries (PICs), and Yemen and Haiti – the lone representatives of the Middle East and the Caribbean, respectively³. Thus, the vast majority of the countries that have completed NAPAs are located in Africa, Asia or the Pacific.

Although recent research (Tacoli, 2011) has suggested that internal migration can play a vital role in building resilience to climate change impacts in developing countries, there appears to be little recognition of this in NAPAs. While a number of NAPAs recognise migration to be a coping strategy adopted by people in the face of climatic stress, this acknowledgement is often tempered by the assertion that climate-induced migration often has negative impacts in receiving areas, such as conflict over land in rural zones and overcrowding in cities. Few adaptation activities proposed in NAPAs actively support autonomous migration, which is typically viewed as a problem associated with climate change that needs to be resolved through policy interventions. Additionally, the need to resettle or relocate vulnerable communities is repeatedly mentioned in NAPAs, while human displacement related to conflict also garners significant discussion, as this type of migration is seen as exacerbating the climate change adaptation challenges faced in some LDCs. This working paper provides an overview of the general findings of the review and also includes a case study of NAPAs from the West African region. Before detailing the review's findings, the remainder of Section 1 will examine the NAPAs policy process, summarise the existing evidence on migration and environmental change and provide a brief overview of the review's methodology.

1.1 Climate change adaptation in Least Developed Countries: the significance of NAPAs

The NAPA policy process consists of each LDC identifying national adaptation priority projects that must be implemented in the immediate future in order to address urgent climate change adaptation needs (Adger, et al., 2007: 731). NAPAs generally contain a number of standard elements, including background information on the country, an assessment of the country's main vulnerabilities to climate change, potential barriers to the implementation of adaptation activities, a list of possible adaptation projects and profiles for each project which is to be implemented (UNFCCC, 2011). Although NAPAs are primarily country-driven documents, LDCs do receive support from external actors in the preparation of their NAPAs. Each country selects a Global Environment Facility (GEF) agency to provide technical assistance on the planning and implementation of its NAPA, with relevant GEF agencies including the United Nations Environment Programme (UNEP), the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the World Bank, among others⁴. Additionally, the Least Developed

³ Three LDCs had not yet submitted NAPAs to the UNFCCC Secretariat at the time of the review, namely Angola, Myanmar and Timor-Leste. Angola and Timor-Leste submitted their NAPAs in late 2011, while Myanmar's NAPA has not yet been finalised.

⁴ Other GEF agencies include the Asian Development Bank, the African Development Bank, the European Bank for Reconstruction and Development, the Inter-American Development Bank and the United Nations Development Organisation.

Country Expert Group (LEG), which is made up of climate change experts from LDCs, is available to provide technical support and advice to LDCs (UNFCCC, 2011).

Perhaps the main benefit of NAPAs lies in their potential to enhance planning capacity in LDCs to address current and future climate threats (Berger, 2011). Nevertheless, the NAPAs policy process has been the target of some pointed critiques in recent years. For example, the UNDP was quite critical of the potential impact of NAPAs in its 2007/2008 *Human Development Report* (cited in Martin, 2010b: 401), arguing that:

First, they provide a very limited response to the adaptation challenge, focussing primarily on 'climate proofing' through small-scale projects... Second, the NAPAs have, in most countries, been developed outside of the institutional framework for national planning on poverty reduction. The upshot is a project-based response that fails to integrate adaptation planning into the development of wider policies for overcoming vulnerability and marginalization⁵.

Others have criticized NAPAs for conducting narrow consultation processes which exclude the most vulnerable groups in society (Huq and Khan, 2006: 196). They argue that NAPAs would benefit from pursuing adaptation measures that focus on the 'vulnerabilities of livelihood support systems', as opposed to NAPAs' current sector-based approach that evaluates climate change impacts according to their predicted impacts in each sector (Huq and Khan, 2006: 196).

In addition to these critiques, the LEG has also noted that many LDCs have experienced problems during the implementation phase of their NAPAs, including delays in accessing funding after individual priority projects have been approved (LEG, 2011: 5). Indeed, there is continued uncertainty surrounding NAPAs' long-term funding. In late 2009, developed countries pledged sustained funding for climate change adaptation and mitigation efforts in developing countries as part of the non-binding Copenhagen Accord reached at the 15th session of the Conference of Parties to the UNFCCC (COP 15), with US\$30 billion in 'new and additional' funds promised for developing countries' adaptation and mitigation activities from 2010 to 2012 and US\$100 billion per year pledged in support of these activities by 2020 (Martin, 2010b: 401-402). However, recent developments have raised serious questions about the stability of NAPAs financing: Of the US\$30 billion pledged by developed countries under the Copenhagen Accord for 2010 to 2012 – commonly referred to as 'fast-start climate funds' – just US\$2.9 billion has been specifically pledged to support adaptation efforts (Ciplet, et al., 2010: 1)⁶. The amount pledged by donor countries that is to be channelled through the UNFCCC, including the Least Developed Countries Fund (LDCF) which supports the preparation and implementation of NAPAs, is even more meagre. As of 31 March 2011, developed countries had pledged just over US\$324 million to the LDCF and had deposited just US\$253.7 million in the fund (Climate Funds Update, 2011).

⁵ Perhaps partly in response to these criticisms, at the 16th session of the Conference of Parties (COP 16) in Cancun in December 2010, the mandate of the LEG was broadened: The group is now charged, *inter alia*, with integrating NAPAs into development planning (UNFCCC, 2011).

⁶ The latest details on climate funds pledged by donors can be found on the Climate Funds Update website: <http://www.climatefundsupdate.org/listing/least-developed-countries-fund>.

The relatively small amount of funding that has thus far been made available to the LDCF reflects wider tensions between developed and developing countries relating to how fast-track climate funds that have been pledged by developed countries should be dispersed. Ciplet and colleagues (Ciplet, et al., 2010: 4) argue that, 'No other funding issue finds Southern countries so united as the call for [fast-track climate] funds to be administered by the UNFCCC.' Despite this, many funds pledged by developed countries as part of the fast-track climate funds have already been directed to Climate Investment Funds (CIFs) administered by international financial institutions (Ciplet, et al., 2010: 1). This issue was addressed to some degree at COP 16 in Cancun in December 2010, where the parties agreed to establish the Green Climate Fund, which will operate as the financial mechanism of the UNFCCC and will be governed by a board composed of equal members of developed and developing countries (COP, 2010). While the fund's stated aim is to mobilise US\$100 billion per year by 2020, there was no agreement at COP 16 about how the funds for the Green Climate Fund will be generated (Blinch and Buckley, 2010), creating the possibility of continued disagreement about how pledged adaptation funds are dispersed in the coming years, which could in turn impact the NAPAs process.

Despite these apparent shortcomings of NAPAs, it is encouraging that migration has been increasingly incorporated into the wider UNFCCC negotiation process in recent years. Although it did not affect that NAPAs under consideration in this working paper, the Cancun Adaptation Framework agreed at COP 16 in Cancun in December 2010 explicitly mentioned migration, potentially paving the way for migration-related adaptation activities to be funded through the UNFCCC in the coming years (Warner, 2011). Paragraph 14(f) of the agreement states that parties should pursue, 'Measures to enhance understanding, coordination and cooperation with regard to climate change induced displacement, migration and planned relocation, where appropriate, at national, regional and international levels' (Warner, 2011: 22). Warner argues that although the Cancun Adaptation Framework presents migration as a technical problem to be 'managed' – rather than a political issue - its language implies that human mobility may play an important role in broader societal transformations needed for adaptation over the longer term (Warner, 2011: 29).

1.2 Migration and climate change: uncertainties about flows and severity of impacts

As Black and colleagues (2011: 431) note, in recent years a number of reports have examined the relationship between climate change and migration (Action Aid International, 2007; Christian Aid, 2007; Conisbee and Simms, 2003; Renaud, et al., 2007; Stern, 2007; Warner, et al., 2009). Nearly all of these reports assert that new waves of climate change-induced migration will emerge in the coming decades, linked in many instances to the presumed failure of climate change adaptation measures (Black, et al., 2011: 431). To cite just two prominent examples, the Stern Review Report on the Economics of Climate Change (Stern, 2007: 77), based on previous work by Myers (Myers and Kent, 1995), estimated that 150-200 million people could be displaced by climate change impacts in the coming decades, while a Christian Aid (2007) report claimed that up to one billion people could be 'climate refugees' by 2050. While these reports have undoubtedly helped to increase awareness of the potential linkages between migration and climate change, the estimates that they cite are based on rather crude calculations that assume widespread out-migration from areas that are negatively impacted by climate change, leading the Fourth Assessment Report of the IPCC (Wilbanks, et al., 2007: 365) to describe these estimates as, 'at best, guesswork'.

In fact, existing research on the relationship between climate events and migration has not established conclusive findings to suggest that either sudden-onset climate events (floods, storms, etc.) or slow-onset climate events (drought, desertification, etc.) necessarily lead to widespread permanent out-migration (Black, et al., 2008: 18). The reason that this relationship is non-linear is because increases in migration are not solely a function of climatic events, but are mediated by a range of intervening factors that can either facilitate or hinder migration in the event of environmental change (Black, et al., 2008: 11). Some common examples of mediating factors include relative ease of transportation, access to family or social networks in potential destination areas and government policies that work to restrict or facilitate emigration, immigration or internal migration (Black, et al., 2008: 11). These intervening factors help to shape migration flows, along with economic, social, political, demographic and environmental 'drivers' (including climate change) that encourage migration out of certain areas to particular destinations (Black, et al., 2011: 432). Thus, as Black and colleagues (2011: 432) argue, 'the impacts of climate change on mobility are mediated through... different drivers with the result that the relationship between migration and climate change becomes highly complex.'

Despite the lack of a clear relationship between migration and climate change, there is some evidence to suggest that internal migration in particular is a common response to climate events (Kniveton, et al., 2009: 76). For example, Kniveton, et al., (2009: 74) observe that, '... there is broad agreement that internal migration often intensifies following major droughts or famines', and indeed a range of studies have documented such patterns of mobility (Shipton, 1990; Findley, 1994; Pederson, 1995; Ezra, 2001; Perch-Nielsen, 2004). Similarly, a recent study on migration and environmental degradation in Nepal found that environmental deterioration in rural areas primarily resulted in short-distance moves within the immediate vicinity of the affected communities, as opposed to long-distance migration to cities (Massey, et al., 2007). Evidence of such internal migratory movements is not solely limited to slow-onset climatic events. According to one study, 88 per cent of residents of agricultural communities in Bangladesh were found to remain within two miles of their previous residence following the erosion of land and loss of homes due to flooding (Zaman, 1989), highlighting the relevance of short-distance internal migration in the face of sudden onset climate shocks as well.

As the above examples make clear, internal migration in response to climatic events is not limited to rural-to-urban migration. Indeed, the direction of internal flows may vary according to the nature of the environmental stress or shock in question. For example, one study in the Indian state of Gujarat found that rural villages reported in-migration from cities following an earthquake in 2001, as many urban residents dealt with quake losses by returning to their extended families in rural areas (Naik, 2009: 272). When the state was experiencing a drought, however, this prompted migration in the reverse direction – from villages to cities (Naik, 2009: 272). As Naik (2009: 273) summarises, 'Despite general trends towards urbanization in the developing world, the available literature shows that people make pragmatic and disaster-specific choices about where best to migrate.'

Similarly, the available evidence on the relationship between international migration and climate change defies simplistic explanations. While the aforementioned Christian Aid report hints at a large volume of international migration occurring as a result of climate change by using the term 'climate refugees', thus suggesting that there will be considerable

international movement of displaced persons, there is a surprising lack of empirical evidence of mass overseas migration resulting directly from environmental change or variability (Black, et al., 2008), and the evidence that is available is patchy and contradictory. One study from El Salvador found that overseas migration increased with poor harvests and loss of livestock, but subsequently decreased following an earthquake in the country (Halliday, 2006). Meanwhile, two separate studies conducted in different regions in Mexico found that international migration to the US either increased or decreased in response to declining annual rainfall depending on the study sites (Munshi, 2003; Kniveton, et al., 2008) again showing the conflicting nature of available evidence. Studies in the West African countries of Burkina Faso (Henry, et al., 2004) and Mali (Findley, et al., 1994), meanwhile, found that overseas migration in both these states fell during drought years.

While it is clearly not possible to draw wide generalisations about migration in LDCs because of their varying geographical locations⁷, there are some lessons highlighted by the recent literature on migration and climate change that are relevant to the consideration of migration in NAPAs. Considering LDCs as a group, there are a number of particular 'intervening factors' which may influence the relationship between migration and climate change in this group of countries. In rural areas, subsistence agriculture continues to be the dominant productive activity in many LDCs, with an estimated 70 per cent of people employed in this area in African nations, for example (Collier, et al., 2009: 128). In these African countries, crops are already grown close to their thermal tolerance, and so a rise in temperatures caused by climate change could potentially lead to widespread crop failure (Collier, et al., 2009: 128-129), possibly prompting farmers to abandon their land and migrate to urban centres.

Furthermore, many inhabitants of cities in low-income countries are often at-risk from climate change impacts, including the increased frequency and intensity of floods, storms and heat waves, as well as water supply constraints (Satterthwaite, 2011: 1778). This is particularly true of informal or illegal settlements in cities, which often lack drainage and other protective infrastructure (Satterthwaite, 2011: 1778). Such settlements are typically home to recent rural-urban migrants, so there is reason to believe that many people may in fact be migrating into urban contexts characterised by a high degree of vulnerability to climate change (Foresight: Migration and Global Environmental Change, 2011: 10). In other cases, the possibilities for migration may be constrained by geography. Small island states, including the group of PICs, provide a relevant example as sea-level rise is already threatening some low-lying islands and the forced displacement of these populations remains a distinct possibility in future decades (Kniveton, et al., 2009: 74). Finally, a number of LDCs can also be classified as fragile or post-conflict states, adding a further dimension of vulnerability for many segments of the population.

⁷ Although a thorough discussion of the geographic variability of climate change impacts is beyond the scope of this report, it is likely that different regions will experience heterogeneous climate change impacts. For example, while annual rainfall is projected to decrease in Mediterranean Africa, northern Sahara and Southern Africa over the coming decades, Eastern Africa could actually see an increase in annual rainfall during this period (Mertz, et al., 2009: 745). Such differences present a further variable to consider with regard to the relationship between migration and climate change.

Broadly speaking, migration – ranging from seasonal, short-distance migration to overseas migration – can act as a vital coping mechanism that helps to offset localised impacts of climate change and enhance residents’ resilience to climate change (Tacoli, 2010). Indeed, citing recent case studies undertaken in Bolivia, Senegal and Tanzania, Tacoli argues that migration has become an increasingly important aspect of rural livelihood strategies in the face of slow-onset climate change impacts such as desertification, soil degradation, disrupted rainfall patterns and changes in temperature (Tacoli, 2011: v). In fact, Tacoli observes that, ‘in all study locations the most vulnerable households are unanimously identified as those who do not receive remittances from migrant relatives’ (Tacoli, 2011: v). This finding illustrates the positive role migration can play in autonomous adaptive strategies to climate change, and challenges the notion that these flows are necessarily detrimental to adaptation efforts.

1.3 Migration and NAPAs: an overview of the review methodology

The Migration RPC’s review of NAPAs sought to carry out a comprehensive analysis of the 45 NAPAs submitted to the UNFCCC by the end of 2010. Using a methodological approach similar to the one that was previously used for reviews of migration in PRSPs (Black and Sward, 2009) and DWCPs (Deshingkar, et al., 2012), the review sought to capture the overall quantitative and qualitative level of discussion of migration in NAPAs by searching each policy document for a range of search terms related to migration, before conducting content analysis of each reference to these terms. The group of search terms included in the review⁸ were derived from a literature review on migration and climate change and a preliminary review of select NAPAs that were conducted as part of this study. Content analysis determined the context in which these terms were discussed and whether this discussion was directly related to the NAPAs’ proposed priority projects. Based on this content analysis, a typology was created in order to classify NAPAs’ attitudes towards migration, focusing on four key areas: (1) references to migration as a coping strategy, (2) discussion of displacement or resettlement of populations, (3) the negative side effects of climate-related migration, and (4) conflict-driven migration impacting countries’ overall adaptation contexts. As mentioned above, the review also included a case study of West Africa, based on the rationale that ten countries from this region have completed NAPAs and that seasonal and cross-border migration in response to climatic stress has been relatively well-documented in this region. This involved additional review of the literature and evidence on the relationship between migration and climate change in this region (see Section 4).

The Migration RPC’s review of NAPAs was not the first study to consider how NAPAs discuss migration. Martin’s (2010a) previous study of NAPAs took stock of the discussion of migration in the 38 NAPAs that had been submitted to the UNFCCC Secretariat as of October

⁸ The search terms included in the review consisted of words and word roots in order to capture references to a range of migration-related phenomena (only references that had a direct bearing on migration were counted). The terms included in the review were: migra*, move*, mobil*, rural exodus, displace*, resettle*/relocat*, border, refugee, circula*, transhuman*, return, remit*. Terms with an asterisk capture multiple words: for example, ‘migra*’ captures *inter alia* ‘migrant’, ‘migration’, ‘migrate’, etc.

2008⁹. Martin (2010a: 1) summarises the findings of her study as follows: ‘Repeatedly, countries reference that loss of habitat and livelihoods could precipitate large-scale migration, particularly from coastal areas that may be affected by rising sea levels and from areas susceptible to increased drought, flooding or other environmental hazards that will affect agriculture.’ Martin emphasises NAPAs’ focus on issues of resettlement and land use, noting that, ‘Adaptation strategies often propose land use policies and programmes that would have the effect of stabilising populations in areas that might experience large-scale out-migration in the absence of such measures’ (Martin 2010a: 6-7). She asserts that fewer adaptation strategies focus on migration as an explicit adaptation strategy in its own right (Martin 2010a: 7).

The Migration RPC’s review builds on Martin’s previous work, providing a more in-depth assessment of the discussion of migration and related terms in NAPAs. Its multi-layered methodology allows for an evaluation of differing levels of migration discussion in NAPAs, an analysis of the migration issues most frequently mentioned, and a detailed picture of the way in which NAPAs incorporate migration into their proposed adaptation activities. However, it is important to mention that there were several limitations to the review. The review did not undertake a systematic assessment of whether the perceptions of migration discussed in NAPAs were backed up by evidence – and instead focused on documenting the types of attitudes about migration that exist in NAPAs. A critical assessment of the viability of migration-related policies that are proposed in NAPAs was also beyond the scope of the review, and with the exception of the West African case study the review did not identify gaps in NAPAs’ discussion of migration issues. Instead, the review was conceived of as a scanning exercise to ascertain the current views of migration in NAPAs. However, the review did seek to develop recommendations on how to improve NAPAs’ treatment of migration in future climate change adaptation policy documents, which are included at the conclusion of this paper.

2. General findings: migration in NAPAs

As was mentioned in Section 1, the discussion of migration in NAPAs overwhelmingly focuses on various types of internal migration, with references to international migration being largely confined to the mention of refugees in a handful of NAPAs. While recent studies (Tacoli, 2011) have suggested that internal migration can play a vital role in building resilience to climate change impacts in developing countries, there appears to be little recognition of this in NAPAs, as migratory ‘coping strategies’ are often seen as producing negative consequences. Moreover, the extent to which migration is discussed in NAPAs varies considerably – and it is clear from existing evidence on migration trends in LDCs that this variability cannot be solely explained by the relative importance of migration in the countries in question. Overall, the search for migration-related terms in NAPAs conducted as part of the review revealed the following broad numerical trends:

⁹ Despite the valuable lessons that emerged from Martin’s review, to date it lacks a definitive report outlining its findings. Instead, the review is summarised in a short briefing paper (Martin 2010a).

- *Countries with ‘substantial’ discussion*: ten NAPAs had 20 or more references for all search terms included in the review, with five countries having in excess of 35 references;
- *Countries with ‘moderate’ discussion*: 14 NAPAs had between ten and 19 total references for all search terms;
- *Countries with limited or negligible discussion*: the remaining 21 NAPAs had fewer than nine overall references for all the search terms included in the review, with 11 of these having five hits or fewer.

Despite this wide range of discussion, the majority of NAPAs were characterised by one dominant perspective of migration that accounted for the majority of their migration discussion.¹⁰ Thus, we constructed a broad typology that accounts for the discussion of migration in NAPAs, based on the most often-cited migration-related topics in each NAPA. Importantly, these are not exclusive categories but rather are meant to illustrate the *primary lens* through which countries view human mobility in their NAPAs:

Type 1 – Migration as a coping strategy: These NAPAs primarily discuss migration as a coping strategy, particularly in response to drought or other slow-onset climate changes that are occurring in the country, but also in some cases as a response to non-climatic factors such as a lack of employment opportunities.

Type 2 – Displacement and resettlement: These NAPAs are preoccupied with population displacement, most frequently due to sea-level rise, flooding or landslides, with resettlement of communities often seen as the primary adaptive response to these impacts. *Type 3 – Negative impacts of migration*: These NAPAs emphasise the negative impacts of human mobility, including both climate-induced migration and other forms of migration, which is seen as contributing to environmental degradation, the spread of disease and pressure on urban infrastructure and services.

Type 4 – Conflict-driven migration: A small group of NAPAs focus primarily on migration caused by civil conflict or wars in neighbouring countries and its impact on the adaptation context.

The following sections will look at the ways in which NAPAs with different levels of migration discussion view migration issues.

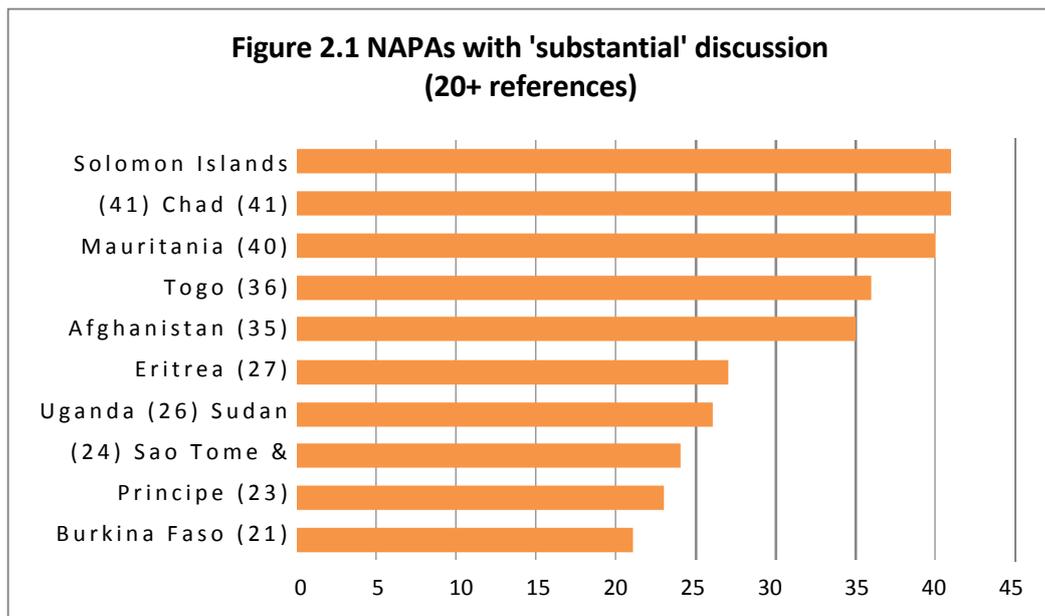
2.1 NAPAs with ‘substantial’ discussion of migration: mobility as a key variable in the adaption challenge

Just ten NAPAs had more than 20 references to the review’s search terms (see Figure 2.1), and while these countries discussed migration in distinct ways, they shared an acknowledgement of the relevance of migration to their national adaptation context. Eight of the NAPAs in this sub-group were from African states, and six of the African countries, namely Chad, Mauritania, Togo, Eritrea, Sudan and Burkina Faso, were predominantly concerned with internal migration as a coping strategy in relation to drought – Type 1 in the

¹⁰ Please refer to Appendix 1 for the full results of the review’s search for migration-related terms. Additionally, countries’ NAPA plans can be viewed at:

http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php

review typology (see Figure 2.2). These NAPAs typically discussed migration that was already occurring in response to recent droughts, especially with respect to rural herders’ increasing reliance on transhumance as a means to find pasture and water for livestock and rural farmers’ rural-urban or rural-rural migration in response to drought negatively impacting their harvests. By contrast, the island nations of Solomon Islands and Sao Tome and Principe fall into Type 2 of the review’s typology, as they were primarily preoccupied with issues of resettlement and displacement. The policy documents for Afghanistan and Uganda constitute relative outliers in the group of NAPAs with ‘substantial’ migration discussion, as the former was concerned primarily with conflict-driven migration (Type 4 in our typology) and the latter was primarily concerned with the negative impacts of migration (Type 3).

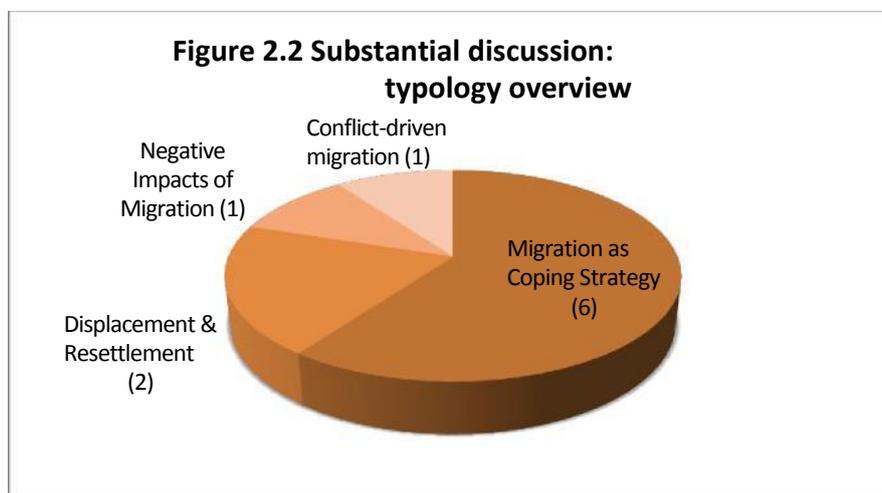


The six African NAPAs in the Type 1 category did not discuss migration as a coping strategy in a completely uniform way, however. In Chad’s NAPA, for example, there are 14 references to transhumance, with herders’ seasonal migration being repeatedly mentioned as a traditional response to drought (Chad NAPA, 2010: vii-viii). In Mauritania’s NAPA, by contrast, the discussion revolves around rural exodus, which is mentioned 14 times. For example, the NAPA notes that as a result of an extended drought in the country during the 1970s and 1980s, ‘formerly nomadic communities settled either in areas they considered most favourable (wetlands), or took part in a massive rural exodus to the main urban centres’ (Mauritania NAPA, 2004: 11). Similarly, Togo’s NAPA refers to rural exodus on 18 occasions, claiming that changes in the onset of the rainy season in the country have led to a range of impacts, including rural exodus and the seasonal migration of farmers (Togo NAPA, 2009: 30). The NAPAs for Eritrea, Sudan and Burkina Faso, meanwhile, all highlight the fact that transhumant migration constitutes an important coping strategy in the face of drought, with Sudan and Burkina Faso also noting that drought has seen rural agricultural producers relocate to areas with higher precipitation, or move to urban areas (Eritrea NAPA, 2007: 24; Sudan NAPA, 2007: 9; Burkina Faso NAPA, 2007: 22).

Importantly, most of these countries do not have a wholly positive view of migration as a ‘coping strategy’. For example, Chad’s NAPA sees climate change-induced migration as leading to competition for the best land (potentially leading to conflict), putting pressure on

urban services and potentially leading to public health problems (Chad NAPA, 2010: 13; 27). Similarly, Mauritania’s NAPA links long-distance transhumance to the potential spread of contagious diseases and asserts that rural exodus in the country has contributed to the formation of disorderly suburban settlements (Mauritania NAPA, 2004: 13; 70). In the case of Togo’s NAPA, the migration of farmers to new lands is linked to deforestation and the NAPA also claims that widespread rural exodus has created a range of problems including sanitation, land use issues and higher rates of unemployment (Togo NAPA, 2009: 19, 64). In a similar vein, Sudan’s NAPA links transhumant migration to an increase in conflict and the spread of disease (Sudan NAPA, 2007: 16, 30), while Burkina Faso claims that rural-to-rural migration leads to environmental degradation in receiving areas and that transhumance can contribute to a range of problems, including conflicts over natural resources (Burkina Faso NAPA, 2007: 4, 55).

By contrast, the NAPAs for Solomon Islands and Sao Tome and Principe primarily discuss the resettlement or relocation of vulnerable low-lying communities. The NAPA for the Solomon Islands refers to relocation and resettlement a total of 28 times – by far the most of any NAPA – including discussion of a comprehensive evaluation plan which seeks to identify vulnerable communities and to resolve land tenure issues involved in relocation efforts (Solomon Islands NAPA, 2008: 86). The NAPA asserts that the islands are already experiencing the effects of climate change, as ‘a lot of coastal communities have moved two to three times...in the last 10 to 15 years, due to the intrusion of high seas and storm surges’ (Solomon Islands NAPA, 2008: 41). Similarly, Sao Tome and Principe’s NAPA notes that coastal erosion on the islands has already caused the displacement of some settlements and includes a priority project aimed at relocating three communities which are at-risk of flooding (Sao Tome and Principe NAPA, 2007: 21-22; 29).

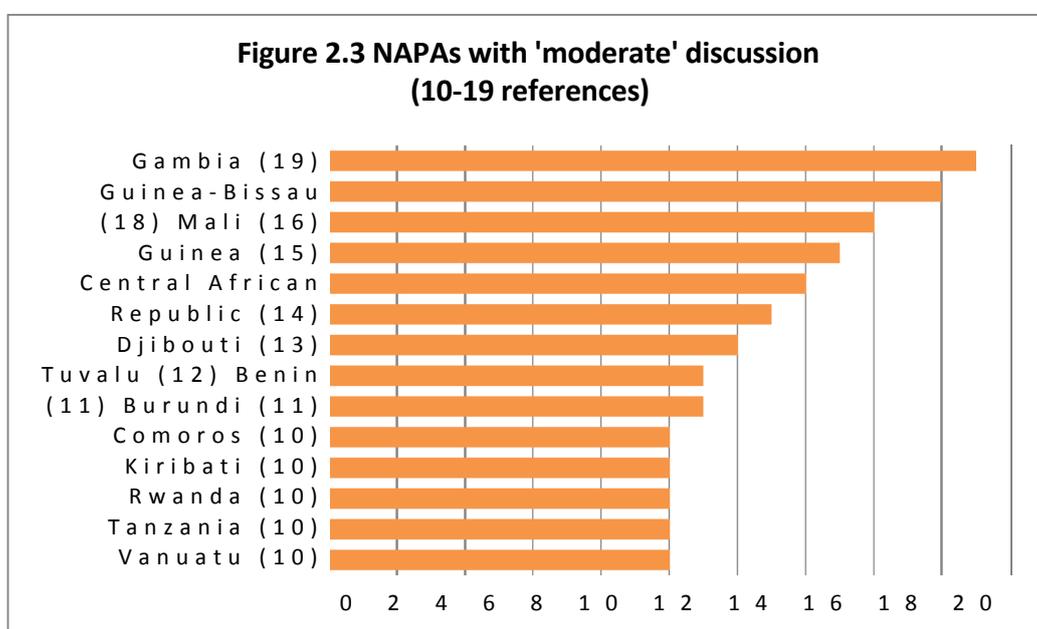


In Afghanistan’s NAPA, meanwhile, the primary focus is on conflict-related migration, with the document claiming that widespread internal and cross-border displacement caused by war has exacerbated the country’s adaptation challenges and contributed to environmental degradation. Displacement is seen as one of a range of issues that complicates land and resource property rights in the country and the return of refugees from abroad is perceived to be putting pressure on the agricultural resource base (Afghanistan NAPA, 2009: 18; 40). While Afghanistan’s NAPA mentions the historical importance of ethnic Kuchi herders’ seasonal migration in terms of it enhancing their resilience to drought, it also mentions that

the traditional migration routes of these herders have been interrupted by warfare (Afghanistan NAPA, 2009: 19). In Uganda’s NAPA, meanwhile, climate-induced migration is seen as having negative impacts, as it is linked to the incidence of conflict, environmental degradation and pressure on infrastructure. For example, the NAPA notes that in dry-land areas, out-migration has occurred in response to a lack of water resources, and that, ‘these movements have frequently led to ethnic conflicts and disruption of production, affecting the development of these communities’ (Uganda NAPA, 2007: 44).

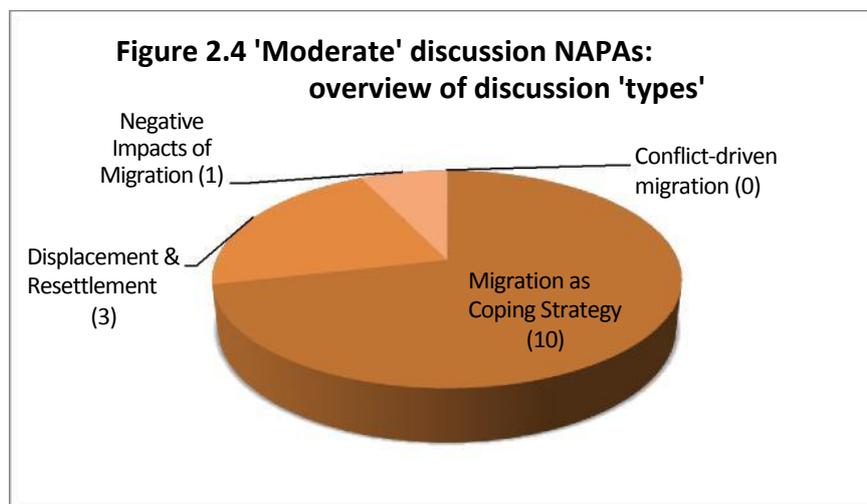
2.2 NAPAs with ‘moderate’ discussion of migration: accounting for mobility in adaptation strategies

Although the manner in which this group of NAPAs discuss migration (see Figure. 2.3) is less comprehensive than their counterparts discussed in Section 2.1, a similar pattern emerges in terms of the issues which are most frequently discussed (see Figure 2.4). Eight of the countries from continental Sub-Saharan Africa in this grouping – Benin, Burundi, the Central African Republic, Djibouti, Gambia, Guinea-Bissau, Mali and Rwanda – fall into Type 1 of the review typology as they primarily discuss migration as a coping strategy for slow-onset climate change impacts, in particular drought and coastal erosion. Two island states, Tuvalu and Comoros, also fall into the Type 1 category, as they view internal migration and emigration as livelihood strategies that are predicated on high unemployment and a lack of opportunity on these islands. By contrast, three countries, Kiribati, Vanuatu and Tanzania, fall into Type 2 of the review’s typology, as they are primarily concerned with issues of displacement or resettlement. Guinea, meanwhile, falls into Type 3 of our typology, as it mainly focuses on the negative impacts of migration, particularly with regard to environmental degradation caused by refugees.



Once again, much of the discussion concerning migration as a coping strategy refers to migratory flows which are already occurring in many African countries. For instance, the NAPA for Gambia notes that poor rainfall distribution has contributed to poverty and food insecurity in rural areas, making the rural workforce more likely to migrate to cities in search of alternative, non-farm livelihoods (Gambia NAPA, 2008: 16). The policy document for

Guinea-Bissau, meanwhile, highlights both the migration of farmers in response to rising salinity levels in mangrove rice fields and an increase in transhumance and rural exodus in response to drought (Guinea-Bissau NAPA, 2008: 32, 33, 42). Mali's NAPA appears to be the lone NAPA – in any category – to directly link drought to international migration. It notes that there has been a significant amount of internal migration from the north of the country to the south and high rates of emigration to coastal countries in West Africa as well as to Europe (Mali NAPA, 2007: 34). The Central African Republic's NAPA discusses increased reliance on transhumance due to drought (Central African Republic NAPA, 2008: 34-35), while Djibouti's NAPA states that three-quarters of the country's population now lives in urban areas, as the combination of recurrent drought and poor management of pastoral lands has helped to spawn a rural exodus, with many formerly nomadic groups settling around water points established by the state (Djibouti NAPA, 2006: 20).



The NAPAs for Tuvalu and Comoros, meanwhile, are concerned primarily with migration that is occurring both internally and internationally, with a lack of employment opportunities – rather than climatic stress – being perceived as the main factor motivating these movements. The Tuvalu NAPA suggests that population growth in the capital, Funafuti, where 42 per cent of the population resides, is due to 'high internal migration in search of employment' (Tuvalu NAPA, 2007: 16). Emigration is linked in Tuvalu's NAPA to low overall population growth, and remittances from overseas are noted as an important source of income in Funafuti and the outlying islands (Tuvalu NAPA, 2007: 15, 17). The NAPA for Comoros, meanwhile, notes the occurrence of both rural exodus and emigration, with the former linked in particular to soil degradation in rural areas and the latter seen as an outcome of weak economic diversity which will could limit the island state's response to climate change (Comoros NAPA, 2006: 10, 26).

The three NAPAs which emphasise displacement or resettlement – Kiribati, Vanuatu and Tanzania – see population displacement caused by sea-level rise as the most pressing type of human mobility related to climate change adaptation. Vanuatu's NAPA notes that the successful relocation of an at-risk community in the northern part of the country has already occurred, following an adaptation assessment and a campaign of public awareness (Vanuatu NAPA, 2007: 20). Kiribati's NAPA also references past community resettlement, although it notes that this process led to 'conflicting claims over resettled land' (Kiribati NAPA, 2007: 11). Both NAPAs view planned resettlement as forming part of their future adaptation

efforts (Vanuatu NAPA, 2007: 23-28; Kiribati NAPA, 2007: 59), although specific resettlement plans are not further elaborated in either of these policy documents. Tanzania's NAPA, meanwhile, emphasises the possibility of sea-level rise contributing to coastal erosion that could displace vulnerable coastal communities (Tanzania NAPA, 2007: 30).

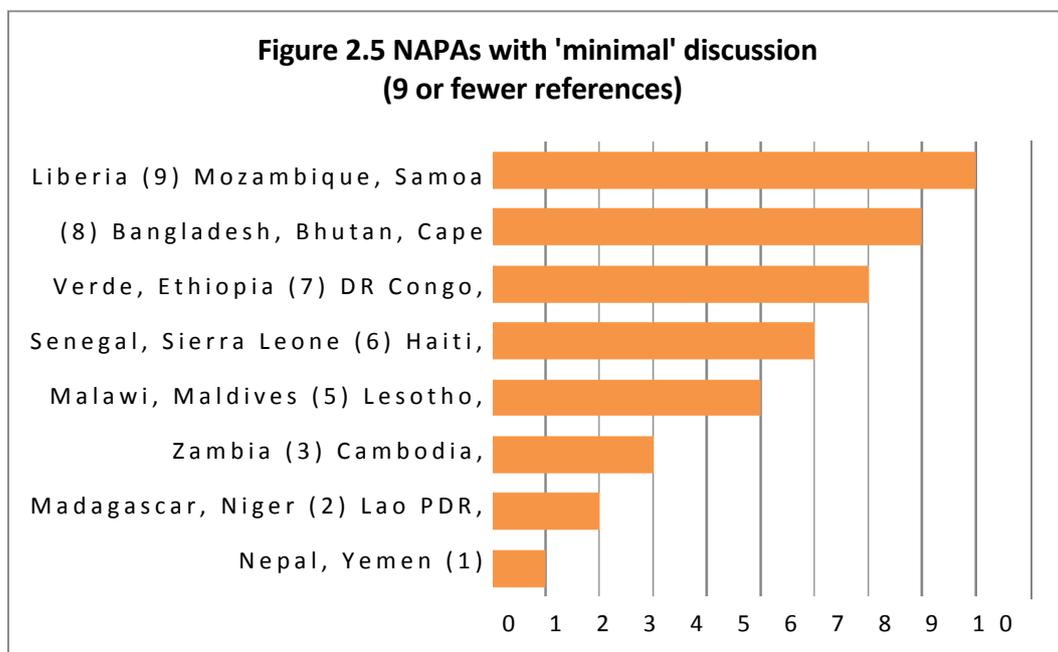
Guinea's NAPA constitutes the primary outlier of the group of NAPAs with 'moderate' discussion of migration, as it mainly dwells on the negative impacts of migration. In particular, it links the presence of refugees in the country to environmental degradation (Guinea NAPA, 2007: 4) and asserts that over-exploitation of resources in the coastal area of the country could result in 'population pressure' precipitated by out-migration from this region, which could potentially lead to land-use conflict in other parts of the country (Guinea NAPA, 2007: e). The NAPA also claims that transhumance contributes both to the spread of disease and to conflicts between herders and farmers (Guinea NAPA, 2007: 19).

2.3 Countries with 'minimal' discussion of migration: little consideration of the impact of mobility on adaptation

This constitutes the largest sub-group of countries, with 21 of the 45 NAPAs referring to the migration-related terms included in the review fewer than ten times (see Figure 2.5). The lack of attention afforded to migration in this group of NAPAs is somewhat puzzling, particularly in Asian countries such as Bangladesh (seven overall references), Cambodia (two references), Lao PDR (one reference) and Nepal (one reference) – all of which are known to be major countries of the migration. This is perhaps most surprising in the case of Bangladesh, which has been widely acknowledged as being at acute risk of climate change, due to the large segment of its population that lives in low-lying coastal regions which are increasingly susceptible to flooding and salinization (Black, et al, 2008: 27). The relative neglect of migration issues in these four NAPAs also illustrates the policy disharmony between the NAPAs of these countries and their PRSPs and DWCPs – which in the case of each of these countries discuss migration to a significant degree (see Black and Sward, 2009; Deshingkar, et al., 2012). This would seem to give further weight to the criticism of NAPAs by the UNDP's 2007/2008 *Human Development Report* – already mentioned in Section 1.1 – which suggests that they are at times developed in isolation from other national development planning processes (cited in Martin, 2010b: 401).

Clearly, perceptions of migration in the sub-group of NAPAs with 'minimal' discussion of migration are less definitive than for the countries with 'moderate' and 'substantial' discussion of migration, owing to the fact that the discussion of migration in this final sub-group is either limited or, in some cases, nearly non-existent. Nevertheless, the migration issues that are most commonly discussed in this group of NAPAs are interesting in that they diverge quite sharply from the types most frequently discussed in the preceding sections: Eight of the countries in this final group – Bhutan, Cape Verde, Malawi, Maldives, Mozambique, Samoa, Senegal, and Zambia – focus mainly on issues of displacement or relocation of communities (Type 2 in the review typology); five countries, including Ethiopia, Cambodia, Lesotho, Madagascar and Niger, view migration primarily as a coping strategy (Type 1); four countries – Bangladesh, Haiti, Nepal and Yemen – mainly highlight the negative impacts of migration (Type 3); while four countries – DR Congo, Lao PDR, Liberia and Sierra Leone – mainly discuss conflict-driven migration or issues related refugees (Type

4). Thus, it is evident that relatively few countries view migration mainly as a coping strategy in this sub-group – despite that fact that this was the dominant view of migration in NAPAs with higher levels of migration discussion – whereas there are proportionally more countries that are primarily concerned with issues of resettlement and displacement, the negative impacts of migration or conflict-driven migration.



3. Policy overview: migration in NAPA priority projects

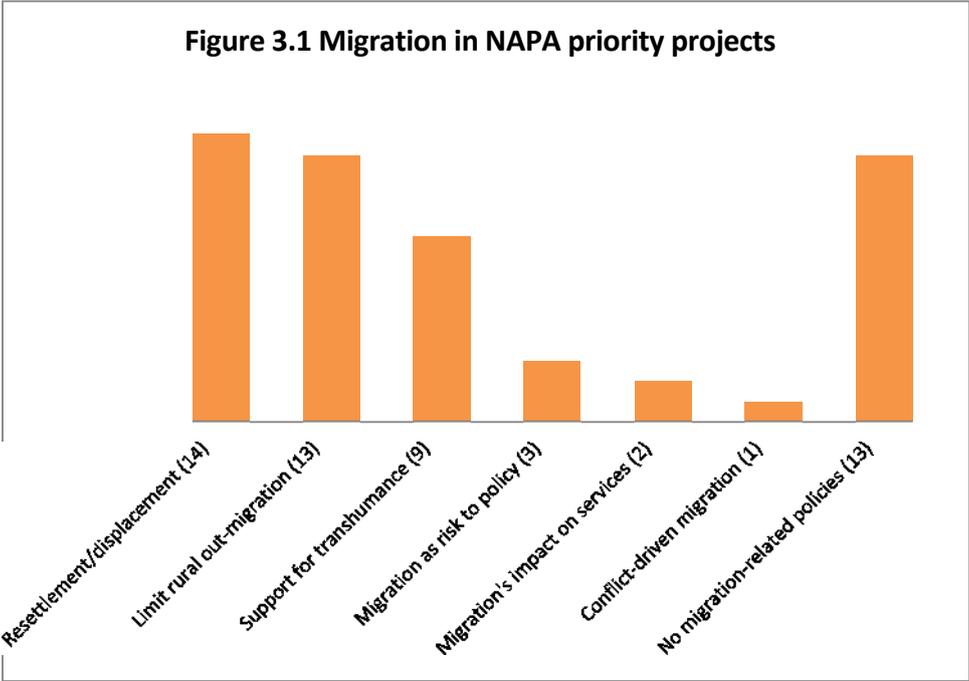
The ambivalent perception of migration in many NAPAs is perhaps most evident in the way that migration is incorporated into NAPAs' proposed adaptation priority projects, which are designed to address countries' immediate climate change adaptation needs. In fact, to the degree that autonomous modes of migration such as 'rural exodus' and 'transhumance' are actually discussed in these policy proposals, states seem determined to halt or reduce the need for such flows. Overall, as Figure 3.1 shows, 14 NAPAs propose priority projects that involve the resettlement of communities or address issues of displacement¹¹; 13 NAPAs include priority projects that aim to limit rural out-migration (especially rural-urban exodus)¹²; nine NAPAs include priority projects related to transhumant migration¹³; three

¹¹ NAPAs that mention resettlement or displacement in their priority projects include Bhutan (2006), Gambia (2008), Haiti (2006), Maldives (2008), Mauritania (2004), Mozambique (2008), Rwanda (2007), Samoa (2005), Sao Tome and Principe (2007), Solomon Islands (2008), Tanzania (2007), Togo (2009), Tuvalu (2007) and Uganda (2007).

¹² NAPAs that mention limiting rural out-migration as part of their priority projects include Afghanistan (2009), Bangladesh (2005), Central African Republic (2008), Comoros (2006), Djibouti (2006), Mali (2007), Mauritania (2004), Rwanda (2007), Senegal (2006), Sudan (2007), Togo (2009), Uganda (2007) and Yemen (2009).

¹³ NAPAs that include reference to transhumant herders in their priority projects include Burkina Faso (2007), Burundi (2007), Central African Republic (2008), Chad (2010), Eritrea (2007), Guinea (2007), Mauritania (2004), Rwanda (2007) and Sudan (2007).

NAPAs see migration as a threat to proposed priority projects¹⁴; two NAPAs seek to resolve public health or services issues related to migration¹⁵; and one NAPA incorporates conflict-driven migration into its priority projects¹⁶. Some NAPAs include migration-related policies in more than one of these areas: For example, Mauritania’s NAPA has priority projects that fall into five of these sub-groupings. Meanwhile, 13 NAPAs do not include any mention of migration or related issues in their proposed priority projects¹⁷.



This section will discuss each of these policy categories as they relate to the review’s typology of migration discussion (see Section 2). NAPA priority projects which deal with the theme of migration as a coping strategy (Type 1 in the review’s typology) thus include policies to limit rural out-migration and support transhumant herders through various policy interventions. Meanwhile, priority projects that refer to resettlement or displacement clearly match up with Type 2 in the review’s typology, which also focused on these issues. Policies which consider migration’s impact on health and services or see migration as a threat to proposed priority projects are consistent with Type 3 in the review’s typology – the negative impacts of migration. Finally, just one country – Sierra Leone – includes mention of conflict-driven migration, Type 4 in the review’s typology, illustrating the fact that although

¹⁴ NAPAs that see migration as a threat to priority projects are Guinea-Bissau (2008), Mauritania (2007) and Niger (2006).

¹⁵ NAPAs that seek to resolve health or services issues related to migration in their priority projects include Mauritania (2004) and Tuvalu (2007).

¹⁶ The only NAPA that includes mention of conflict-driven migration in its priority projects is Sierra Leone (2008).

¹⁷ NAPAs that do not mention migration in their priority projects include Benin (2008), Cambodia (2007), Cape Verde (2007), DR Congo (2006), Ethiopia (2008), Kiribati (2007), Lao PDR (2009), Lesotho (2007), Liberia (2007), Madagascar (2006), Malawi (2006), Vanuatu (2007) and Zambia (2007).

this was a commonly discussed theme in some NAPAs, this discussion was confined in most cases to the ‘country context’ section of these documents.

3.1 Policies on ‘coping strategies’: limiting rural exodus and transhumance

Negative views of rural migration have historically been common among developing country governments, including those in Sub-Saharan Africa (see for example Adebusoye 2006), so it is perhaps not surprising that limiting rural out-migration is a common feature of many NAPAs from this region. Furthermore, the LDC Expert Group’s published guidelines for the preparation of NAPAs actually endorse such policies, suggesting that ‘investments in fragile and marginalized areas sensitive to climate change’ can help to reduce rural-urban migration (LEG, 2002: 27). However, there is little evidence to support this claim, as historically speaking the vast majority of policy efforts to limit rural out-migration across the developing world have generally failed in all but the short term (Skeldon 2009: 12). Policies which seek to keep rural residents ‘on the farm’ also ignore the positive role that migration can play in diversifying rural livelihood strategies and making households more resilient to environmental change, as discussed in Section 1.2¹⁸.

Ten out of the 13 countries that discuss limiting rural out-migration in their NAPA priority projects are in Africa (see footnote 12). Mauritania’s NAPA cites limiting rural exodus as part of the rationale for a range of the adaptation measures it proposes, including the introduction of drought-resistant cereal production (Mauritania NAPA, 2004: 54), the establishment of water-saving irrigation (Mauritania NAPA, 2004: 55-56) and the improvement of farming techniques (Mauritania NAPA, 2004: 57). Similarly, Sudan’s NAPA seeks to halt rural exodus through a programme to revive gum arabic trees (Sudan NAPA, 2007: 43) and by introducing water harvesting methods in rural areas (Sudan NAPA, 2007: 45). In the same vein, Mali’s priority projects aim to decrease the on-going rural exodus in the country through the establishment of fish-raising practices in rural areas (Mali NAPA, 2007: 53), the use of meteorological forecasts to assist in agricultural production (Mali NAPA, 2007: 57) and by extending micro-credit programs to women and youth who remain in rural areas after other family members have migrated (Mali NAPA, 2007: 50).

Similarly, the NAPAs for Togo and Senegal propose projects aimed at benefitting the agriculture sector in order to reduce rural exodus. Togo’s NAPA calls for the development of irrigation systems and gardening practices in rural areas in an attempt to halt rural exodus (Togo NAPA, 2009: 102), while Senegal’s NAPA also calls for the establishment of irrigation systems in order to offset the country’s increasingly erratic rainy season, with the aim of decreasing the rural exodus of farmers (Senegal NAPA, 2006: 53). The NAPA for Central African Republic, meanwhile, proposes that rural employment could be generated through harvesting waste products from commercial logging operations, which could help to stem rural exodus (Central African Republic NAPA, 2008: 60). Similarly, the NAPAs for Djibouti, Rwanda and Uganda all discuss land conservation or rehabilitation projects in order to slow rural out-migration (Djibouti NAPA, 2006: 67, 68; Rwanda NAPA, 2007: 37; Uganda NAPA,

¹⁸ This is not to say that governments shouldn’t invest in rural areas, but rather that there is little evidence that such investment will stop migration.

2007: 53). The NAPA for Comoros, meanwhile, claims that constructing low-cost housing in rural areas will limit rural exodus (Comoros NAPA, 2006: 76).

A handful of NAPAs for countries outside Africa also employ this policy logic, as the NAPAs for Afghanistan, Bangladesh and Yemen all include priority projects designed in part to slow rural out-migration. Bangladesh's NAPA includes priority projects that seek to prevent salinization and flooding (Bangladesh NAPA, 2005: 35-36; 37) in order to help stem rural-urban migration and 'reduce the social problems of migration of the distressed community to cities' (Bangladesh NAPA, 2005: 37). Meanwhile, Afghanistan's NAPA includes a priority project on improved water management that cites drought forcing families to migrate to urban areas as part of its rationale (Afghanistan NAPA, 2009: 80). Similarly, a priority project in Yemen's NAPA aims to rehabilitate and maintain mountain terraces in order to slow out-migration from agricultural areas (Yemen NAPA, 2009: 42).

The nine NAPAs that make reference to transhumant migration in their priority projects, meanwhile, are all from continental Africa (see footnote 13), underlining the fact that pastoral movements remain an important livelihood activity in many African LDCs. While all of these countries have more or less 'supportive' stances towards transhumance, the policies they propose for the most part seek to reduce or eliminate the need for this type of migration. Chad's NAPA is a case in point, as it includes priority projects that aim to create water points along traditional transhumance routes (Chad NAPA, 2010: 41), improve communal grazing lands in order to decrease the need for long-distance transhumance (Chad NAPA, 2010: 51) and establish fodder banks to prevent the large-scale displacement of herders (Chad NAPA, 2010: 57). Similarly, Eritrea's NAPA calls for the improvement of rangeland productivity in order to reduce herders' reliance on long-distance moves (Eritrea NAPA, 2007: 29) and aims to encourage pastoral groups to adopt drought-resistant animals, such as sheep and goats (Eritrea NAPA, 2007: 32). The latter policy is echoed verbatim in a priority project introduced in Guinea's NAPA (2007: 68), indicating the cross-pollination of policy approached across some NAPAs.

Sudan's NAPA, meanwhile, includes priority projects which seek to create water catchments to decrease the need for transhumant migration in search of water and pasture (Sudan NAPA, 2007: 39) and to prevent the further deterioration of pastoral rangelands (Sudan NAPA, 2007: 43). Similarly, Burkina Faso's NAPA seeks to support transhumant herders and make them less reliant on pastoral migration through a priority project that aims to stockpile feed for livestock (Burkina Faso NAPA, 2007: 43-44). The NAPA also includes a priority project that seeks to secure pastoral land in the Sahel in order to limit the need for cross-border or internal transhumance (Burkina Faso NAPA, 2007: 52). The remaining NAPAs that discuss policies related to transhumance propose similar solutions: for example, Burundi's NAPA encourages the agricultural production of fodder for livestock in order to limit the need for transhumance (Burundi NAPA, 2007: 52); the Central African Republic's NAPA seeks to rehabilitate vegetation in pastoral areas (Central African Republic NAPA, 2008: 56); Mauritania's NAPA seeks to promote livestock mobility through the provision of support to nomadic herders (Mauritania NAPA, 2004: 45-47); and Rwanda's NAPA includes a conservation programme designed to prevent soil erosion in order to reduce the need for the migration of herders (Rwanda NAPA, 2007: 37). While these policies seek to support transhumant communities, attempts to control the movement of herders may in fact make them more vulnerable to shifts in climate.

3.2 Policies on resettlement and displacement

Despite the fact that many island states are facing the prospect of drastic resettlement and displacement in the coming decades, paradoxically half of the NAPAs (seven of the 14) that include mention of these issues in their priority projects are located in continental Africa (see footnote 11). Additionally, three Pacific Island Countries fall into this category, as do the island states of Haiti, Maldives and Sao Tome and Principe. Bhutan represents an outlier as the lone land-locked Asian state to mention resettlement in its NAPA priority projects.

In the case of the seven continental African NAPAs in this category, resettlement is often viewed as a viable way to address the risks faced by 'vulnerable' communities, while other policies seek to enact preventive measures to avoid future population displacement. For example, Uganda's NAPA includes a measure to assess the 'need to relocate communities at risk of flooding and landslides to safer districts' (Uganda NAPA, 2007: 56), while Tanzania's NAPA calls for the 'relocation of vulnerable communities in low-lying areas' as part of one of its priority projects (Tanzania NAPA, 2007: ix). In a different vein, the NAPA for Gambia notes that a priority project which calls for the rehabilitation of a river basin will involve the displacement of current residents and mentions the need to provide compensation as part of these resettlement efforts (Gambia NAPA, 2008: 82). Togo's NAPA, meanwhile, calls for the establishment of an early warning system for floods in both the savannah and coastal regions of the country, citing the need to prevent excessive displacement of the population as part of the rationale for this project (Togo NAPA, 2009: 92). Similarly, Rwanda's NAPA proposes the creation of a National Plan for Disaster Management, including a protocol for looking after displaced populations following environmental catastrophes (Rwanda NAPA, 2007: 19).

Unsurprisingly, the NAPAs for the PICs and other island nations are by-and-large preoccupied with resettlement as a result of rising sea levels. A prominent example of this is the NAPA for the Solomon Islands, which calls for the creation of a relocation plan for vulnerable communities on low-lying or artificially built up islands (Solomon Islands NAPA, 2008: 85-87). Similarly, Samoa's NAPA proposes the 'incremental relocation of community and government assets' to areas outside Coastal Hazard Zones as one of its priority projects (Samoa NAPA, 2005: 48-49). The NAPA for the Maldives, meanwhile, includes a priority project which aims to help communities adapt to rising sea levels through the strengthening of its Safer Island Strategy, which it developed in 2004 to resettle communities from smaller, more vulnerable islands to larger, better protected ones (Maldives NAPA, 2008: 47, 50). And the NAPA for Sao Tome and Principe aims to relocate three communities that are vulnerable to flooding and landfalls (Sao Tome and Principe NAPA, 2007: 48), while Haiti's NAPA calls for the relocation of an unplanned coastal community outside Port-au-Prince which is primarily home to recent rural-urban migrants (Haiti NAPA, 2006: 43). The NAPA states that the construction of this settlement has resulted in the loss of mangroves and that the community is vulnerable to flooding and contributes to water pollution because of sanitation issues (Haiti NAPA, 2006: 43).¹⁹

¹⁹ For an in-depth analysis of the potential problems linked to adopting such resettlement schemes as part of climate change adaptation efforts, see McDowell, 2011.

3.3 Policies on the ‘negative impacts’ of climate-related migration

As was mentioned at the start of this section, a small number of NAPAs attempt to resolve health or services issues related to migration in their priority projects (see footnotes 14 and 15). For example, Mauritania’s NAPA includes a project that refers to the need to create orderly settlements in suburban areas that have become heavily populated due to rural exodus (Mauritania NAPA, 2004: 70). Tuvalu’s NAPA, meanwhile, suggests that internal migration to urban areas has led to water shortages, which it cites as part of the rationale for a proposed urban water conservation project (Tuvalu NAPA, 2007: 45). Additionally, some NAPAs explicitly list various types of migration as a threat to priority projects that they propose in their policy documents. For example, Mauritania’s NAPA views rural exodus as a risk to a range of priority projects planned for rural areas, including water catchment (Mauritania NAPA, 2004: 58), installation of drip irrigation in river valleys and oasis zones (Mauritania NAPA, 2004: 60), and the construction of flood deceleration gates (Mauritania NAPA, 2004: 61) and electronic water pumps (Mauritania NAPA, 2004: 62). This is presumably because rural out-migration could lessen the need for these projects. Similarly, Niger’s NAPA suggests that a priority project which seeks to build the capacity of rural producers could be jeopardised by the mobility of some parties who are targets of the project (Niger NAPA, 2006: 69). The NAPA for Guinea-Bissau, meanwhile, identifies conflicts between farmers and herders caused by transhumant migration as one of the perceived risks to a project that would bring irrigation systems to rural areas (Guinea-Bissau NAPA, 2008: 73).

3.4 Beyond climate migration: policies on conflict-driven migration and NAPAs which ignore migration issues

The lone NAPA to propose a priority project explicitly related to conflict-driven migration is Sierra Leone’s NAPA, which includes an HIV/AIDS prevention programme which is aimed in part at refugees and internally displaced persons, with these groups being seen as at-risk of infection (Sierra Leone NAPA, 2008: 102-103). Although conflict-driven migration is widely discussed in the NAPAs of many post-conflict states, primarily in Sub-Saharan Africa, clearly this is not an issue that many countries have incorporated into their immediate adaptation strategies. Significantly, 13 NAPAs – nearly one-third of all NAPAs – make no mention of migration in their proposed priority projects (see footnote 17). Not surprisingly, these 13 countries are among those that contain little overall discussion of migration in their NAPAs: Just three of these countries (Benin, Kiribati and Vanuatu) have ten or more references to the migration-related terms included in the review, while the remainder fall into the category of ‘minimal discussion’ analysed in Section 2.

4. Case study: migration and adaptation in West Africa

In all, ten West African states have completed NAPAs – Benin, Burkina Faso, Gambia, Guinea, Guinea Bissau, Liberia, Mali, Senegal, Sierra Leone and Togo. The extent to which migration was discussed in these countries’s NAPAs varied: the NAPAs for Togo and Burkina Faso had the most robust discussion of migration with more than 20 overall references to the review’s search terms; the NAPAs for Benin, Gambia, Guinea, Guinea-Bissau and Mali, had ‘moderate’ discussion of migration, with between ten and 19 references to the review’s migration-related search terms; while the NAPAs for Liberia, Senegal and Sierra Leone had

'minimal' discussion of migration, with less than ten references to migration and related issues. This case study will provide background context on climate-change related migration in the region, before providing analysis of three commonly referenced migration-related themes in West African NAPAs. These are: (1) increased transhumance and rural exodus in response to drought affecting agricultural and pastoral activities; (2) sea-level rise and flooding leading to potential population displacement and/or the resettlement of at-risk communities; and (3) negative impacts associated with human mobility, including environmental degradation, pressure on urban services and links between migration and disease. In conclusion, the case study identifies some of the gaps in the discussion of migration in West African NAPAs.

4.1 Migration and climate change: the West African context

Before the era of colonialism in West Africa the majority of migration took place for reasons of basic security, trade, and the search for fertile arable land to be used for farming and subsequently for settlements (Skinner, 1963; Boahen, 1966; Brand, 1972; Sutton, 1983; Anderson and Rathbone, 2000). However, colonialism brought in its wake new political and economic structures – notably the introduction of tax regimes and the establishment of new territorial boundaries. In addition, colonial recruitment policies, such as compulsory recruitment as well as contract and forced labour legislation, brought about labour migration, particularly from Mali, Togo and Upper Volta (Burkina Faso) to plantations and mines in Gold Coast (Ghana) and Ivory Coast (Côte d'Ivoire) (Hill, 1961; Nabila, 1972; Peil, 1974; McEvoy, 1977; Stock, 2004). The massive transportation network that was developed within the West African sub-region facilitated this migration process during the colonial period (Adepoju, 2005). Patterns of migration in recent times in the sub-region are therefore rooted in socio-economic, political and historical-cultural factors which have helped to shape development and economic activities in West Africa and are particularly relevant in the case of international migration (Adepoju, 2005).

In recent times, climate change has posed an increasingly recognizable threat to the employment and wellbeing of many West Africans. In agricultural areas, particularly in the arid Sahel region, drought and changes in precipitation have contributed to the deterioration of rural economies, which is reflected in declining incomes, malnutrition and hunger (Harthill, 2008). The degradation of soil and water resources and the escalation of droughts and floods have led to the overestimation of agricultural yields and profits. Realization of such, in many cases, has resulted in farming families sending one or more of their barely-adult offspring to the more resource-rich south, first to reduce the pressure of mouths to feed but also with the anticipation that these migrants may be able to generate remittances to send home to their families in the Sahel – a common livelihood strategy in Sub-Saharan Africa (Bryceson, 2009). In other instances, these migrations have been to international destinations. In a related development, although patterns of migration and transhumance of Fulani herdsmen from the Sahel to the Savannah zone of Africa have existed for centuries, there is evidence that the phenomenon is increasing in recent times (Tonah, 2000). This can potentially be attributed to shifts in agro-ecological zones, in other words a southward expansion of the Sudan savannah as a result of climatic changes. Such a shift does not only alter growing conditions for crops and pastures but can also bring in its wake tensions between farmers and herders as they struggle over scarce resources (Fasona and Omojola, 2005; Obioha, 2005).

4.2 Theme one: increased transhumance and rural exodus in response to drought

This is the migration issue that attracts the most overall discussion in West African NAPAs: Eight of the ten countries in the region discuss this theme to some degree, and four of the five NAPAs with the most overall migration discussion in the region (Togo, Burkina Faso, Guinea Bissau and Mali) discuss this theme substantively. For example, the NAPA for Togo widely discusses rural migration and drought, claiming that drought and changes in the onset of the rainy season have led to rural exodus and the seasonal migration of farmers (Togo NAPA, 2009: 30). The NAPA predicts that future climate change impacts in the agricultural sector could include a decrease in agricultural yields and an increase in the severity of pests and diseases, potentially changing current patterns of arable land use and spawning further rural exodus (Togo NAPA, 2009: 38). Meanwhile, the NAPA for Burkina Faso observes that transhumance, which was once unknown in many areas of the country, is now widespread due to recurring drought (Burkina Faso NAPA, 2007: 4). While this type of migration is noted as a coping mechanism (Burkina Faso NAPA, 2007: 20), it has also created a range of problems, according to the NAPA, including conflicts over natural resources and the death of livestock during long-distance journeys (Burkina Faso NAPA, 2007: 55).

The relationship between drought and human mobility is also acknowledged in other West African NAPAs, which typically cite patterns of migration which are already occurring. The NAPA for Gambia claims that 'poor intra-seasonal rainfall distribution' has decreased food security, rural poverty and hardship, which has led many young people from rural areas to migrate to urban areas in search of alternative, non-farm employment (Gambia NAPA, 2008: 16). Similarly, in Guinea's NAPA transhumance during the dry season is seen as constituting part of a set of existing practices that make up endogenous knowledge of adaptation in the country (Guinea NAPA, 2007: 24). However, the Guinean NAPA nonetheless views herders as one of the groups at risk because of climate change, as it predicts that climate change will lead to the reduction of livestock numbers due to a decrease in grazing areas and the proliferation of disease (Guinea NAPA, 2007: 19). The NAPA also predicts that increased reliance on transhumance and more frequent conflicts between farmers and herders are possible outcomes of climate change in the country (Guinea NAPA, 2007: 19).

Similarly, the NAPA for Guinea-Bissau notes that a decrease in rainfall combined with a rise in temperatures has negatively impacted the availability of grazing land and water points, leading to transhumance becoming more widespread (Guinea-Bissau NAPA, 2008: 33). Furthermore, the NAPA perceives 'rural exodus' to be one of the potential impacts of drought in the coming years (Guinea-Bissau NAPA, 2008: 43). This discussion is mirrored in Mali's NAPA, which observes that persistent drought since the 1970s has resulted in migration becoming an important strategy for many rural inhabitants in the face of increasingly precarious environmental conditions (Mali NAPA, 2007: 11). The NAPA argues that migration has been a spontaneous reaction to drought, with many Malians moving to urban centres, other West African countries or Europe in order to find work and send back money to families who remain behind (Mali NAPA, 2007: 34). Meanwhile, the NAPAs for Benin and Senegal also discuss transhumance or rural exodus in response to drought

although both documents focus on the perceived negative impacts of these types of migration²⁰.

4.3 Theme two: sea-level rise, flooding and population displacement

Eight of the ten West African countries' NAPAs also include some level of discussion on this migration-related theme – although it is not discussed in the same depth as migration related to drought. Unquestionably, sea-level rise is a significant issue in the region because many of West Africa's largest cities, including Lagos, Accra, Abidjan, Conakry, etc., are located on fragile coasts or river deltas. Thus a great deal of the region's economic, social and political infrastructure is concentrated in at-risk coastal areas, underlining the need for the protection of these zones. Populations in these locations are highly vulnerable to sea-level rise, coastal erosion and increasing salinity in water tables. Furthermore, in a number of countries in the region sea-level rise and coastal erosion are already occurring and these impacts in some cases present an immediate threat to coastal populations.

The issue of sea-level rise leading to displacement or resettlement in coastal areas is mentioned in the NAPAs for the West African countries of Togo, Gambia, Guinea-Bissau, Guinea, Benin, Sierra Leone and Senegal. The issue is discussed most substantively in the Senegal NAPA, which claims that coastal erosion is threatening nearly every major coastal city in the country (Senegal NAPA, 2006: 22). In fact, the NAPA notes that coastal erosion has resulted in the relocation of several coastal communities that were displaced after being damaged by strong waves (Senegal NAPA, 2006: 55). The other West African NAPAs, by contrast, are more concerned with the prospect of future sea-level rise. For example, Togo's NAPA notes that rising sea levels is expected to result in coastal erosion and thus the future displacement of coastal settlements (Togo NAPA, 2009: 2). Meanwhile, the NAPAs for Gambia, Guinea-Bissau, Guinea, Benin and Sierra Leone, respectively, identify resettlement of coastal communities as a potential future adaptation measure in response to sea-level rise but stop short of including it in their immediate adaptation activities (Gambia NAPA, 2008: 47; Guinea-Bissau NAPA, 2008: 44; Guinea NAPA, 2007: 14; Benin NAPA, 2008: 60; Sierra Leone NAPA, 2008: 24).

Additionally, four West African NAPAs note that human settlements are currently at-risk of flooding or refer to severe flooding that has occurred in recent years that has led to the displacement of populations. For example, Togo's NAPA notes that flooding in 2007 caused widespread damage and displaced an estimated 34,000 people (Togo DWCP, 2009: 29). Meanwhile, Mali's NAPA identifies the relocation of populations who live in 'flood disaster areas' to more appropriate sites as a possible adaptation activity, although this is not taken up in the NAPA's priority projects (Mali NAPA, 2007: 35). Similarly, Benin's NAPA notes that

²⁰ For example, Benin's NAPA sees rural exodus as an unsustainable existing adaptation measure to climatic stress and asserts that transhumance (which is occurring on a large-scale in the country because of drought) has led to significant conflicts between herders and farmers (Benin NAPA, 2008: 49, 27). The Senegalese NAPA, meanwhile, recognises that the rural poor are likely the most vulnerable group to climate change impacts such as drought and that one of their primary coping strategies is rural exodus to cities, which it claims leads to problems in urban areas (Senegal NAPA, 2006: 61).

displacement due to flooding is one of several climate change impacts expected to affect the country (Benin NAPA, 2008: 60). Finally, Senegal's NAPA observes that the annual rainy season typically results in damage to infrastructure and homes, often necessitating the temporary relocation of affected populations (Senegal NAPA, 2006: 22).

4.4 Theme three: negative impacts associated with migration

Seven of the ten West African NAPAs refer to the negative impacts of migration, reflecting the fact that governments' perceptions of migration in the region remain ambivalent, at best. Although Togo's NAPA refers to internal migration as a coping strategy in the face of climatic stress (Togo NAPA, 2009: 46, 47), it also claims that widespread rural exodus could lead to a range of problems in urban areas, including sanitation and land use issues, security problems and higher rates of unemployment (Togo NAPA, 2009: 64). Senegal's NAPA repeats verbatim the Togolese NAPA's argument about rural exodus potentially putting pressure on urban areas, citing the same issues as points of concern (Senegal NAPA, 2006: 61). Meanwhile, Guinea's NAPA claims that rural exodus will contribute to 'population pressure' in the country, although it does not elaborate beyond this vague statement (Guinea NAPA, 2007: e). Furthermore, three West African NAPAs link migration to the spread of disease. Gambia's NAPA claims that the mobility of populations both in the country's coastal zone and along the Trans-Gambia route contribute to risk of infectious disease outbreaks (Gambia NAPA, 2008: 21, 25). Meanwhile, Guinea's NAPA links transhumant migration to the spread of disease (Guinea NAPA 2007: 19) and a HIV/AIDS prevention programme mentioned in Sierra Leone's NAPA targets refugees and internally displaced persons on the basis that these groups are particularly vulnerable to infection (Sierra Leone NAPA, 2008: 102-103).

Additionally, two West African NAPAs link migration to environmental degradation. Burkina Faso's NAPA claims that people who have migrated because of drought in the country have contributed to environmental degradation at their places of reception (Burkina Faso NAPA, 2007: 4). Meanwhile, Guinea's NAPA asserts that the prolonged stay of refugees in the country is one factor, in addition to cattle ranching and logging, that has contributed to the deforestation (Guinea NAPA, 2007: 4). By contrast, Liberia's NAPA focuses on the impact of conflict-driven displacement in the country during its civil war²¹, which caused widespread disruption to the agrarian sector (Liberia NAPA, 2008: 20). The NAPA notes that, 'There was widespread population displacement, particularly the rural one into IDPs' and refugees' camps. Farms and equipment were abandoned and looted, with livestock either killed or looted by fighters of the civil war' (Liberia NAPA, 2008: 20).

4.5 Gaps in the migration discussion in West African NAPAs

Considered as a group, there are some notable gaps in West African NAPAs' discussion of migration. Firstly, migration due to flooding is a rather marginalised topic of discussion in the NAPAs produced by Sahelian countries such as Mali, Niger, Senegal and Mauritania. However, the region has experienced instances of flooding due to heavy rainfall in recent

²¹ Fourteen years of civil war in Liberia formally ended in August 2003 with the flight into exile of former President Charles Taylor (Bøås 2005: 73).

years and the latest scientific projections suggest that there is more to come (Christiansen, et al., 2007). While there remains a lack of scientific consensus regarding the affect climate change will have on the Sahel, there is recent data on a possible increase in rainfall (Nicholson, et al., 2000; Nicholson, 2005) and debates on the ‘greening’ of the Sahel based on remotely sensed vegetation values and improved soil and water conservation (Rasmussen, et al., 2001; Olsson, et al., 2005; Herrmann, et al., 2005), as well as speculation regarding a potential shift to substantially wetter periods (Ozer, et al., 2002; Hubert, et al., 2005). Additionally, the Fourth Assessment Report of the IPCC (Christiansen, et al., 2007) projects that high intensity rainfall events and associated flooding in West Africa are expected to increase by 20 per cent in the coming decades. Despite this emerging body of evidence, the long-standing ‘desertification narrative’ is still predominantly used to understand the Sahelian landscape, of which drought constitutes the quintessential core (Tschakert, et al., 2010). The tendency of this narrative to over-emphasise the significance of drought and to under-represent the threat posed by flooding is to a certain extent mirrored by West African NAPAs’ discussion of climate-induced migration.

Secondly, in recent years female migrants – including unaccompanied married females – have been drawn to the wage labour market (both formal and informal) as a livelihood strategy to supplement dwindling family income (Adepoju, 2000). Thus, traditional, male-dominated migratory streams in West Africa are increasingly being complemented by female migration. Another form of migration on the increase in the sub-region is the migration of independent child migrants and trafficked children (Frempong-Ainguah, et al., 2010). Flows of child migration have been documented from Togo, Nigeria and Mali to Côte d’Ivoire, where children often work on plantations or as domestic servants (Adepoju, 2005), and from rural parts of Ghana to the capital of Accra (Kwankye, et al., 2009). These phenomena could become more common in response to climate change as sources of rural employment continue to dwindle. The review shows that West African NAPAs do not account for how climate change will affect these existing migration patterns.

5. Policy implications

Based on the findings of the Migration RPC’s review of migration in NAPAs, there are at least three key policy lessons that would enable NAPAs to mainstream issues related to migration and human mobility into proposed adaptation activities:

Firstly, following Huq and Khan (2006), we suggest that the adoption of a livelihood-based approach – as opposed to a sector-based approach – would be a first step towards ensuring that NAPAs benefit vulnerable groups, including migrants. A livelihood-based approach to adaptation that considers migration to be an integral part of many rural livelihood strategies – as opposed to migration being merely an *ad hoc* reaction to climatic stress – is essential in order to create adaptation strategies which do not risk further disenfranchising poor migrants in LDCs. While some NAPAs seem to recognise that migration is an endogenous coping strategy in response to climatic stress, the policies proposed in NAPAs generally seek to reduce migration flows, which could possibly have negative repercussions for migrants who move because of interconnected climatic, economic and social factors.

Secondly, there is a need to build capacity in LDCs to enable governments to adequately cope with the pressures of rural-to-urban migration. Too often policies focus on attempting

to limit rural exodus, but while economic or climatic factors arguably contribute to these flows, other factors such as changing expectations of rural youth and new off-farm employment opportunities for young women are also important factors that encourage internal migration in some countries (see for example Tacoli and Mabala, 2010). Despite the potential benefits that rural-urban migration may bring for migrants and their families, such migrants may also face significant risks, including lack access to adequate housing, health services and formal social protection. As many cities in developing countries are likely to be at-risk of flooding and sea-level rise in the coming decades, policies that address issues of rural-urban migrants' vulnerability are a potentially vital aspect to adaptation efforts in urban areas. This is particularly important as many informal or illegal settlements in urban centres, which are often home to recent migrants, lack proper drainage and sanitation infrastructure (Satterthwaite, 2011: 1778) and are thus particularly at-risk to flooding and related health risks. Simply removing or relocating these settlements is likely to negatively affect the economic and social situations of current residents, and governments and donors alike need to reach durable solutions which make such urban areas more resilient to climate threats.

Thirdly, there is a need to better integrate NAPAs into national poverty reduction strategies and other development frameworks, as adaptation needs and poverty reduction targets are likely to increasingly overlap in the coming years. As was mentioned in Section 2.3, there is a significant amount of policy disharmony between some countries' NAPAs and PRSPs, particularly in the case of NAPAs submitted by several Asian LDCs. Both national poverty reduction strategies and NAPAs would benefit from employing a new, more balanced perspective of migration. Under the right conditions, migration can contribute to both poverty reduction and climate change adaptation, but many states continue to employ a negative view of migration as being a symptom of failed development or a barrier to adaptation.

In conclusion, while many NAPAs do acknowledge the importance of migration as a coping strategy, they seem to be unsure of how to integrate such migratory flows into their climate change adaptation plans. Rather than viewing migration solely as a problem to be solved, migration should be appreciated as being a potentially important adaptive practice in many LDCs. However, the projected impacts of climate change – ranging from long-running droughts to sudden floods – are diverse and are likely to influence migration trends in distinct ways, demanding different policy responses in different country contexts. In sum, the types of migration that are likely to emerge due to climate change will not be uniform, but rather disaster- and location-specific. Broadly speaking, in the case of slow-onset climate change impacts governments and international agencies should attempt to find positive ways to engage with migrants who are affected by these changing realities, rather than simply introducing measures which attempt to stop migration flows. On the other hand, the prospect of increased storm intensity, flooding and other natural disasters highlights the need to ensure the safety of those who are displaced with little warning.

6. References

- Adebusoye, P.M. (2006) 'Geographic Labour Mobility in Sub-Saharan Africa', International Development Research Centre (IDRC) Working Paper No. 1 on Globalization, Growth and Poverty, Ottawa: IDRC. Available online: <<http://www.idrc.ca/uploads/user-S/11438237051GGPWP1-migration.pdf>>
- Action Aid International (2007) *Unjust waters: climate change, flooding and the protection of poor urban communities: experiences from six African cities*, Johannesburg: Action Aid International.
- Adepoju, A. (2005) 'Migration in West Africa.' Paper prepared for the Policy Analysis and Research Programme of the Global Commission on International Migration. Geneva: GCIM.
- Adepoju, A. (2000) 'Fostering Free Movement of Persons in West Africa: Achievements, Constraints, and Prospects for Intraregional migration.' *International Migration Review* 40(2): pp. 3-28.
- Adger, W.N., Argawala, S. and Qader Mirza, M.M. (2007) 'Assessment of adaptation practices, options, constraints and capacity.' In: Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden, P.J. and Hanson, C.E., eds. *Climate Change 2007: Impacts Adaptation and Vulnerability. Working Group II Contribution to the Fourth Assessment Report of the IPCC*. Cambridge and New York: Cambridge University Press, pp. 717-743.
- Afghanistan NAPA (2009) [online] UNFCCC. Available at: <http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011]
- Anderson, M.D. and Rathbone, R. (2000) 'Urban Africa: Histories in the Making'. In: Anderson, M.D. and Rathbone, R. (eds.), *Africa's Urban Past*. Oxford: James Currey, pp. 1-17.
- Bangladesh NAPA (2005) [online] UNFCCC. Available at: <http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Benin NAPA (2008) [online] UNFCCC. Available at: <http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Berger, R. (2011) 'UN Climate Negotiations in Durban: A Guide for the Perplexed', Climate Change and Development Seminar Series, co-hosted by the Institute for Development Studies and the University of Sussex's School of Global Studies, 3 November, Brighton, UK.

- Bhutan NAPA (2006) [online] UNFCCC. Available at:
 <http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Black, R., Kniveton, D. and Schmidt-Verkerk, K. (2011) 'Migration and climate change: towards an integrated assessment of sensitivity'. *Environment and Planning A* 43: pp. 431-450.
- Black, R., et al. (2008) 'Demographics and Climate Change: Future Trends and Their Policy Implications.' Migration DRC Working Paper T-27, Brighton: Development Research Centre on Migration, Globalisation and Poverty, University of Sussex.
- Black, R. and Sward, J. (2009) 'Migration, Poverty Reduction Strategies and Human Development.' Background Paper for the UNDP Human Development Report 2009/38, New York: UNDP.
- Blinch, R. and Buckley, C. (2010) 'Climate talks end with modest steps, no Kyoto deal.' [online] Reuters. Available at:
 <<http://www.reuters.com/article/idUSTRE6AR1OI20101212>> [Accessed 19 July 2011].
- Boahen, A.A. (1966) *Topics in West African History*. London: Longman.
- Bøås, M. (2005) 'The Liberian civil war: new war/old war?' *Global Society* 19(1): pp. 73-88.
- Brand, R. (1972) *A geographical interpretation of the European influence on Accra, Ghana since 1877*. PhD Dissertation, Columbia University, New York.
- Brown, O. (2008) *Migration and Climate Change*. IOM Migration Research Series, Report No. 31, Geneva: IOM.
- Bryceson, D.F. (2009) 'Sub-Saharan Africa's Vanishing Peasantries and the Specter of a Global Food Crisis', *Monthly Review*, July-August: pp. 48-62.
- Burkina Faso NAPA (2007) [online] UNFCCC. Available at:
 <http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Burundi NAPA (2007) [online] UNFCCC. Available at:
 <http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Cambodia NAPA (2007) [online] UNFCCC. Available at:
 <http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Cape Verde NAPA (2007) [online] UNFCCC. Available at:
 <http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].

- Central African Republic NAPA (2008) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Chad NAPA (2010) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Christian Aid (2007) *Human Tide: The Real Migration Crisis*. London: Christian Aid.
- Christiansen, J.H., et al. (2007) 'Regional climate projections: climate change 2007: the physical science basis.' In: Solomon S., Qin, D., Manning, M., Chen, Z., Marquis, M., Avery, K.B., Tignor, M. and Miller, H.L. eds. *Climate Change 2007: The Physical Science Basis; Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge and New York: Cambridge University Press, pp. 847–940.
- Ciplet, D., Chandani, A., Roberts, J.T. and Huq, S. (2010) 'Fast-start adaptation funding: keeping promises from Copenhagen.' International Institute for Environment and Development (IIED) Briefing Paper, November. London: IIED.
- Climate Funds Update (2011) *Least Developed Countries Fund* [online]. Available at: <http://www.climatefundsupdate.org/listing/least-developed-countries-fund> [accessed 20 June 2011].
- Collier, P., Conway, G. and T. Venables (2009) 'Climate Change and Africa.' In: Helm, D. and Hepburn, D. eds. *The Economic and Politics of Climate Change*. Oxford: Oxford University Press, pp. 125-141.
- Comoros NAPA (2010) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Conisbee, M. and Simms, A. (2003) *Environmental Refugees: The Case for Recognition*. London: New Economics Foundation.
- COP (2010). *Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention [The Cancun Agreement]*. [online] Available at: http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf [Accessed 19 July 2011].
- Deshingkar, P., Sward, J., and Estruch-Puertas, E. (2012) 'Migration and Decent Work: An Analysis of How Decent Work Country Programmes View Human Mobility with a Special Emphasis on Internal Migration.' Migration RPC Working Paper 5, Brighton: Migrating out of Poverty Research Programme Consortium, University of Sussex.
- Djibouti NAPA (2006) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].

- DR Congo NAPA (2006) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php> [Accessed 15 September 2011].
- Eritrea NAPA (2007) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php> [Accessed 15 September 2011].
- Ethiopia NAPA (2008) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php> [Accessed 15 September 2011].
- Ezra, M. (2001) 'Ecological Degradation, Rural Poverty, and Migration in Ethiopia: A contextual analysis.' Working Paper No. 149, Policy Research Division, New York: Population Council.
- Fasona J.M and Omojola A.S. (2005) 'Climate Change, Human Security and Communal Clashes in Nigeria.' Paper presented at the Human Security and Climate Change international workshop, Asker, Norway, 21-23 June.
- Findley, S.E. (1994) 'Does drought increase migration? A study of migration from rural Mali during the 1983-1985 drought.' *International Migration Review* 28(3): pp. 539-553.
- Foresight: Migration and Global Environmental Change (2011) *Final Project Report*. London: The Government Office for Science.
- Frempong-Ainguah, F., Badasu, D. and Codjoe, S.N. (2010) 'North-South Independent Child Migration in Ghana: The Push and Pull Factors'. In: Anarfi, J.K and Kwankye, S.O., eds. *Independent Migration of Children in Ghana*. Accra: Sundel Services, pp. 71-100.
- Gambia NAPA (2008) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php> [Accessed 15 September 2011].
- Guinea NAPA (2007) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php> [Accessed 15 September 2011].
- Guinea-Bissau NAPA (2008) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php> [Accessed 15 September 2011].
- Haiti NAPA (2006) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php> [Accessed 15 September 2011].
- Hartill L. (2008) 'Understanding West Africa's rising food prices'. Catholic Relief Services (CRS), April 28. [online] Available at:
<<http://www.reliefweb.int/rw/rwb.nsf/db900sid/SKAI-7E5Q4G?OpenDocument&rc=1&cc=gha>>

- Halliday, T. (2006). 'Migration, risk, and liquidity constraints in El Salvador.' *Economic Development and Cultural Change*, 54(4): pp. 893-925.
- Henry, S., Schoumaker, B. and Beauchemin, C. (2004) 'The impact of rainfall on the first out-migration: A multi-level event-history analysis in Burkina Faso.' *Population and Environment*, 25(5): pp. 423-460.
- Herrmann, S.M., Anyamba, A. and Tucker, C.J. (2005) 'Recent trends in vegetation dynamics in the African Sahel and their relationship to climate'. *Global Environmental Change* 15: pp. 394–404.
- Hill, P. (1961) 'The Migrant Cocoa Farmers of Southern Ghana.' *Africa* 31(3): pp. 209-230.
- Hubert P., Bader J.C., Bendjoudi H. (2005) Un siècle de débits annuels du fleuve Sénégal. Presented at the Montpellier HSM Seminar, Impacts climatiques et anthropiques sur la variabilité en ressources d'eau, Montpellier, 22–24 November.
- Huq, S. and Khan, M.R. (2006) 'Equity in National Adaptation Programmes of Action (NAPAs): The case of Bangladesh.' In: Adger, W. N., J. Paavola, S. Hug and M.J. Mace eds. *Fairness in Climate Change Adaptation*. London and Cambridge, Mass., MIT Press: pp. 181-200.
- Kiribati NAPA (2007) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Kniveton, D., Smith, C., Black, R., and Schmidt-Verkerk, K. (2009) 'Challenges and approaches to measuring the migration-environment nexus.' In: F. Laczko and C. Aghazarm eds. *Migration, Environment and Climate Change: Assessing the Evidence*. Geneva: ILO, pp. 41-112.
- Kniveton, D., Schmidt-Verkerk, K., Smith, C. and Black, R. (2008) *Climate Change and Migration: Improving Methodologies to Estimate Flows*. IOM Migration Research Series, Report No. 33, Geneva: IOM.
- Kwankye, S.O., Anarfi, J.K., Tagoe, C.A., and Castaldo, A. (2009) 'Independent North-South Child Migration in Ghana: The Decision Making Process.' Migration DRC Working Paper T-29, Brighton: Development Research Centre on Migration, Globalisation and Poverty, University of Sussex.
- Lao PDR NAPA (2009) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- LEG (2011) 'Report from the nineteenth meeting of the Least Developed Countries Expert Group.' [online] UNFCCC Secretariat. Available at: <http://unfccc.int/resource/docs/2011/sbi/eng/04.pdf> [Accessed 19 July 2011].
- LEG (2002) *Annotated guidelines for the preparation of national adaptation programmes of action*. [online] Available at:

- <http://unfccc.int/essential_background/library/items/3599.php?such=j&symbol=FC/CC/PRT/202%20B%20#beg> [Accessed 19 July 2011].
- Lesotho NAPA (2007) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Liberia NAPA (2007) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Madagascar NAPA (2006) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Malawi NAPA (2006) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Maldives NAPA (2008) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Mali NAPA (2007) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011].
- Martin, S. (2010a) 'Climate Change, Migration and Adaptation.' GMF Background Paper on Climate Change and Migration, Washington: The German Marshall Fund of the United States.
- Martin, S. (2010b) 'Climate Change, Migration, and Governance', *Global Governance* 16: pp. 397-414.
- Massey, D., Axinn, W. and Ghimire, D. (2007) *Environmental Change and Out-Migration: Evidence from Nepal*. Population Studies Center Report 07-615, Ann Arbor, Mich.: Population Studies Center, University of Michigan.
- Mauritania NAPA (2004) [online] UNFCCC. Available at:
<http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php> [Accessed 15 September 2011]
- McDowell, C. (2011) 'Climate Change Adaptation and Mitigation: Implications for Land Acquisition and Population Relocation'. Working Paper 3, Foresight Project on Migration and Global Environmental Change. London: The Government Office for Science
- McEvoy, F.D. (1977) 'Understanding Ethnic Realities among the Grebo and Kru Peoples of West Africa', *Africa*, 47(1): pp. 62-80.

- Mertz, O., Halsnaes, K., Oelsen, J.E. and Rasmussen K. (2009) 'Adaptation to Climate Change in Developing Countries.' *Environment Management* 43: pp. 743-752.
- Mozambique NAPA (2008) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php [Accessed 15 September 2011].
- Munshi, K. (2003) 'Networks in the modern economy: Mexican migrants in the US labour market.' *Quarterly Journal of Economics*, 118(2): pp. 549-599.
- Myers, N. and Kent, J. (1995) *Environmental Exodus: An Emergent Crisis in the Global Arena*. Washington DC: The Climate Institute.
- Nabila, J.S. (1972) 'Depopulation in Northern Ghana: Migration of the Frafra People.' In: David, A.S., Laing, E. and Addo, N.O. eds. *Interdisciplinary Approaches to Population Studies (No. 4)*. Legon: University of Ghana Population Studies.
- Naik, A. (2009) 'Migration and Natural Disasters.' In: F. Laczko and C. Aghazarm eds. *Migration, Environment and Climate Change: Assessing the Evidence*. Geneva: ILO, pp. 245-318.
- Nepal NAPA (2010) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php [Accessed 15 September 2011].
- Nicholson S. (2005) 'On the question of "recovery" of the rains in the West African Sahel.' *Journal of Arid Environment* 63: pp. 615-641.
- Nicholson S.E., Some B. and Kone, B. (2000). 'An analysis of recent rainfall conditions in West Africa, including the rainy seasons of the 1997 El Niño and the 1998 La Niña years.' *Journal of Climate* (13): pp. 2628-2640.
- Niger NAPA (2006) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitte_d_napas/items/4585.php [Accessed 15 September 2011].
- Obioha, E.E., (2005) 'Climate change, population drift and violent conflict over land resources in North Eastern Nigeria.' Paper presented at the "Human Security and Climate Change", international workshop, Asker, Norway, 21-23 June.
- Olsson L., Eklundh L. and Ardoe J., (2005) 'A recent greening of the Sahel—trends, patterns, and potential causes.' *Journal of Arid Environment* 63: pp. 556-566.
- Ozer P., Ericum M., Demaré, G., and Vandiepenbeeck M. (2002) 'The Sahelian drought may have ended the 1990's: discussion of "analysis of a Sahelian annual rainfall index from 1896 to 2000; the drought continue" by L'Hôte, et al.' *Hydrological Sciences Journal* 48(3): pp. 489-496.
- Pederson, J. (1995) 'Drought, migration and population growth in the Sahel – the case of the Malian Gourma, 1900-1991.' *Population Studies* 49: pp. 111-126.

- Peil, M. (1974) 'Ghana's Aliens.' *International Migration Review* 8 (3): pp. 367-381.
- Perch-Nielsen, S. (2004) *Understanding the effect of climate change on human migration: The contribution of mathematical and conceptual models*. MSc Environmental Physics, Swiss Federal Institute of Technology, Zurich.
- Rasmussen, K., Fog, B. and Madsen, J.E. (2001) 'Desertification in reverse? Observations from northern Burkina Faso.' *Global Environmental Change* 11: pp. 271–282.
- Renaud, F., Bogardi, J.J., Dun, O. and Warner, K. (2007) 'Control, adapt or flee – how to face environmental migration?' *InterSecTions* No. 5. Bonn: United Nations University Institute for Environment and Human Security.
- Rwanda NAPA (2007) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Samoa NAPA (2005) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Sao Tome and Principe NAPA (2007) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Satterthwaite, D. (2011) 'How urban societies can adapt to resource shortage and climate change.' *Philosophical Transactions of the Royal Society A* 369: 1762-1783.
- Senegal NAPA (2006) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Shipton, P. (1990) 'African famines and food security.' *Annual Review of Anthropology* 19: pp. 353-394.
- Sierra Leone NAPA (2008) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Skeldon, R. (2009) 'Skilled Migration: Boon or Bane? The Role of Policy Intervention.' DIIS Working Paper 2009:23. Copenhagen: Danish Institute for International Studies.
- Skinner, E.P. (1963) 'Strangers in West African Societies.' *Africa* 33(4): pp. 307-320.
- Solomon Islands NAPA (2008) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Stark, O. and Katz, E. (1986) 'Labour migration and risk aversion in least developed countries'. *Journal of Labour Economics* 4: pp. 134-149.

- Stern, N. (2007) *The Economics of Climate Change: The Stern Review*. Cambridge: Cambridge University Press.
- Stock, R. (2004) *Africa, South of the Sahara. A Geographical Interpretation*. New York: Guilford Press.
- Sudan NAPA (2007) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Sutton, I. (1983) 'Labour in commercial agriculture in Ghana in the late 19th and early 20th centuries.' *Journal of African History* 24: pp. 461-483.
- Tacoli, C. (2010) 'Moving to adapt to climate change.' IIED Reflect & act series. London: International Institute for Environment and Development.
- Tacoli, C. (2011) 'Not only climate change: mobility, vulnerability and socio-economic transformations in environmentally fragile areas of Bolivia, Senegal and Tanzania.' IIED Human Settlements Working Paper Series, Rural Interactions and Livelihoods Strategies – 28. London: International Institute for Environment and Development.
- Tacoli, C. and Mabala, R. (2010) 'Exploring mobility and migration in the context of rural-urban linkages: why gender and generation matter.' *Environment and Urbanization* 22: pp. 389-396.
- Tanzania NAPA (2007) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Todaro, M.P. (1971) 'Income expectations, rural-urban migration, and employment in Africa.' *International Labour Review* 104: pp. 391-395.
- Togo NAPA (2009) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Tonah, S. (2000) 'State Policies, Local Prejudices and Cattle Rustling along the Ghana-Burkina Faso Border.' *Africa* 70(4): pp. 551-567.
- Tschakert, P., Sagoe, R., Ofori-Darko, G. and Codjoe, S.N., (2010) 'Floods in the Sahel: An analysis of anomalies, memory and anticipatory learning.' *Climatic Change* 103: pp. 471-502.
- Tuvalu NAPA (2007) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Uganda NAPA (2007) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].

- UN CDP (2008) *Handbook on the Least Developed Country Category: Inclusion, Graduation and Special Support Measures*. New York: UN Department of Economic and Social Affairs.
- UNFCCC (2011) *Frequently Asked Questions about LDCs, LEG and NAPAs*. Online at: http://unfccc.int/cooperation_support/least_developed_countries_portal/frequently_asked_questions/items/4743.php [Accessed 19 July 2011].
- Vanuatu NAPA (2007) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Warner, K., et al. (2009) *In Search of Shelter: Mapping the Effects of Climate Change on Human Migration and Displacement*. A joint publication of the United Nations University Institute for Environment and Human Security, CARE International, the Center for International Earth Science Information Network at Columbia University, the United High Commission for Refugees and the World Bank.
- Warner, K. (2011) 'Migration and displacement in the context of adaptation to climate change: developments in the UNFCCC climate negotiations and potential for action'. Background Paper PD23, UK Government's Foresight Project on Migration and Global Environmental Change. London: The Government Office for Science.
- Wilbanks, T.J., et al. (2007) 'Industry, settlement and society,' In: Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden, and C.E. Hanson eds. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press, pp. 357-390.
- Zaman, M. (1989) 'The social and political context of adjustment to riverbank erosion hazard and population resettlement in Bangladesh.' *Human Organization* 48: pp. 196-205.
- Yemen NAPA (2009) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].
- Zambia NAPA (2007) [online] UNFCCC. Available at: http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php [Accessed 15 September 2011].

7. Appendix: Full Review Results

Note to readers: resettle* was not included in results for French-language NAPAs due to the lack of a satisfactory translation for this term.

Country	year published	document language	migra*	move*	mobil*	rural exodus	displace*	resettle*	relocat*
Afghanistan	2009	END	16	U	3	U	7	U	U
Bangladesh	2005	END	5	2	U	U	U	U	U
Benin	2008	FRA	2	1	U	2	1	U*	U
Bhutan	2006	END	1	U	U	U	U	5	1
Burkina Faso	2007	FRA	6	2	U	1	1	U*	U
Burundi	2007	FRA/END	4	1	U	U	4	U	U
Cambodia	2007	END	1	1	U	U	U	U	U
Cape Verde	2007	END	1	U	U	3	3	U	U
Central African Republic	2008	FRA	6	U	U	1	U	U*	U
Chad	2010	FRA	14	5	U	3	5	U*	U
Comoros	2006	FRA/END	6	1	U	3	U	U	U
DR Congo	2006	FRA	U	U	U	2	3	U*	U
Djibouti	2006	FRA	4	U	U	5	U	U*	U
Eritrea	2007	END	2	9	U	U	2	3	2
Ethiopia	2008	END	4	U	U	U	2	1	U
Gambia	2008	END	9	U	3	U	1	4	U
Guinea	2007	FRA	1	U	1	1	1	U*	U
Guinea-Bissau	2008	END	3	3	U	2	2	U	U
Haiti	2006	FRA	4	1	U	U	U	U*	U
Kiribati	2007	END	2	1	U	U	U	4	3
Lao PDR	2009	END	U	U	U	U	U	1	U
Lesotho	2007	END	3	U	U	U	U	U	U
Liberia	2007	END	U	U	U	U	5	1	U
Madagascar	2006	FRA	2	U	U	U	U	U*	U
Malawi	2006	END	U	U	U	U	1	3	U
Maldives	2008	END	U	U	1	U	U	3	U
Mali	2007	FRA	8	U	2	4	1	U*	U
Mauritania	2004	FRA/END	1	9	14	14	U	U	1
Mozambique	2008	END	2	U	U	U	3	2	1
Nepal	2010	END	2	U	U	U	U	U	U
Niger	2006	FRA/END	U	1	1	U	U	U	U
Rwanda	2007	FRA/END	7	1	U	U	2	U	U
Samoa	2005	END	1	U	U	U	U	U	6
Sao Tome and Principe	2007	END	1	1	U	U	7	U	12
Senegal	2006	FRA	U	U	U	2	1	U*	3
Sierra Leone	2008	END	U	U	U	U	4	U	U
Solomon Islands	2008	END	2	7	2	U	2	4	24
Sudan	2007	END	12	1	1	U	7	1	1
Tanzania	2007	END	2	1	U	U	1	U	6
Togo	2009	FRA	2	U	U	18	16	U*	U
Tuvalu	2007	END	7	U	U	U	U	3	U
Uganda	2007	END	12	3	U	U	6	U	1
Vanuatu	2007	END	U	U	U	U	U	U	1U
Yemen	2009	END	1	U	U	U	U	U	U
Zambia	2007	END	U	U	U	U	3	U	U

Full results continued:

Country	year	border	refugee	circula*	transhuman*	return	remit*	Total
Afghanistan	2009	0	4	0	2	3	0	35
Bangladesh	2005	0	0	0	0	0	0	7
Benin	2008	0	0	0	5	0	0	11
Bhutan	2006	0	0	0	0	0	0	7
Burkina Faso	2007	0	0	0	11	0	0	21
Burundi	2007	0	0	0	1	1	0	11
Cambodia	2007	0	0	0	0	0	0	2
Cape Verde	2007	0	0	0	0	0	0	7
Central African Republic	2008	0	0	0	7	0	0	14
Chad	2010	0	0	0	14	0	0	41
Comoros	2006	0	0	0	0	0	0	10
DR Congo	2006	0	1	0	0	0	0	6
Djibouti	2006	0	2	0	2	0	0	13
Eritrea	2007	0	3	0	0	1	5	27
Ethiopia	2008	0	0	0	0	0	0	7
Gambia	2008	1	0	0	1	0	0	19
Guinea	2007	0	3	0	8	0	0	15
Guinea-Bissau	2008	0	0	0	8	0	0	18
Haiti	2006	0	0	0	0	0	0	5
Kiribati	2007	0	0	0	0	0	0	10
Lao PDR	2009	0	0	0	0	0	0	1
Lesotho	2007	0	0	0	0	0	0	3
Liberia	2007	0	3	0	0	0	0	9
Madagascar	2006	0	0	0	0	0	0	2
Malawi	2006	1	0	0	0	0	0	5
Maldives	2008	0	1	0	0	0	0	5
Mali	2007	0	0	0	1	0	0	16
Mauritania	2004	0	0	0	1	0	0	40
Mozambique	2008	0	0	0	0	0	0	8
Nepal	2010	0	0	0	0	0	0	2
Niger	2006	0	0	0	0	0	0	2
Rwanda	2007	0	0	0	0	0	0	10
Samoa	2005	0	0	0	0	0	1	8
Sao Tome and Principe	2007	0	0	2	0	0	0	23
Senegal	2006	0	0	0	0	0	0	6
Sierra Leone	2008	0	2	0	0	0	0	6
Solomon Islands	2008	0	0	0	0	0	0	41
Sudan	2007	1	0	0	0	0	0	24
Tanzania	2007	0	0	0	0	0	0	10
Togo	2009	0	0	0	0	0	0	36
Tuvalu	2007	0	0	0	0	0	2	12
Uganda	2007	0	4	0	0	0	0	26
Vanuatu	2007	0	0	0	0	0	0	10
Yemen	2009	0	0	0	0	0	0	1
Zambia	2007	0	0	0	0	0	0	3