

# HUMAN MOBILITY IN THE CONTEXT OF CLIMATE CHANGE AND DEVELOPMENT COOPERATION

## ***Online Appendix***

***to the report "Evaluierung von Maßnahmen zur Anpassung an den Klimawandel. Instrumente zum Umgang mit residualen Klimarisiken" (Evaluation of Climate Change Adaptation Measures. Instruments for Managing Residual Climate Risks)***

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# IMPRESSUM

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## Abstract:

Human mobility in the context of climate change is a multidimensional issue of increasing importance to the scientific community as well as to development cooperation because it has a pivotal role in the achievement of the Sustainable Development Goals. This study analyses climate migration by incorporating climate factors into the existing theoretical frameworks. The study finds that climate migration includes strategies such as coping, adapting, and building resilience, and that the drivers of climate migration vary widely across socioeconomic and geographical contexts. It reveals that in development cooperation climate migration is increasingly being mainstreamed into development projects, and that a diverse set of tools is being used to harness the potential benefits of migration and minimise the risks of uncoordinated settlement. The study recommends that development actors finance underfunded adaptation activities, include the affected populations in the decision-making processes, support sustainable urbanisation and urban development with a focus on marginalised people and existing social networks, and implement institutional innovations.

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## 1. INTRODUCTION

Climate change is having a significant impact on natural and socio-economic systems in a way that affects both individuals and social structures. The scientific community began to concentrate on climate change in the 1970s (Broecker, 1975) but it focused almost exclusively on mitigation until the 1990s, after which climate change adaptation (CCA) became increasingly important (Rayner and Malone, 1997). In the field of development cooperation, CCA has gained importance in the 21st century and has become increasingly prominent in the project portfolios of development actors (Agrawala and van Aalst, 2008; Eriksen and Naess, 2003; Huq and Reid, 2004). In this context, climate science has been providing development actors with an increasing understanding of climate change and its diverse impacts.

Migration is one strategy for adapting to climate change, but it has many facets. On the one hand, it can reduce exposure to climate hazards, diversify livelihoods, increase household income, reduce the number of family members who depend on a single household income, and provide new skills and technologies for returning migrants (Tacoli, 2009). On the other hand, outward migration can make communities weaker, and inward migration can draw migrants into insecure areas with greater climate risk. It is therefore important that development and humanitarian actors, and policy makers, understand the underlying drivers of migration in order to intervene and support the affected people in relevant and effective ways.

A pressing issue is that of “trapped” populations – the economically disadvantaged who are unable to migrate, or those that cannot or do not want to leave their place of origin (Ayeb-Karlsson et al., 2018; Black et al., 2011). Such populations can become exposed to a deepening cycle of poverty and vulnerability and are often at risk of humanitarian emergencies (Adams, 2016; Nawrotzki et al., 2016b; Nawrotzki and DeWaard, 2018). To address this, development and humanitarian actors are supporting plans for community resettlement and migration, and are enabling adaptation strategies (Ahmed and McEvoy, 2014; Ferris, 2012; Nawrotzki and DeWaard, 2018; Stal, 2011).

This article first reviews relevant theories and concepts to understand mobility related to climate change, then discusses different types of mobility, relevant policy instruments, and possible future scenarios. It closes by setting out some policy implications. An expanded and modified version of this study has been published as an open access article in *Population and Environment* (Stojanov et al., 2021).

## 2. THEORIES AND CONCEPTS

There are various theoretical viewpoints on migration, which can be analysed at individual, household, national or international levels (Massey et al., 1994). The connection between migration and environmental change is studied in the fields of migration studies and environmental sciences, but research gaps remain. However, environmental issues are rarely addressed in migration *theory*, and this paper sets out to address the applicability of environmental issues and their influence on the most common migration theories.

While neo-classical migration theory mainly focuses on individuals – who compare wages in different countries and weigh up the costs of (international) migration in order to make the best decision for themselves and their household – it can be expanded to incorporate environmental issues into personal decision-making (Massey et al., 1993).

In the push–pull concept, in which negative (push) factors result in people leaving their communities, and positive (pull) factors attract them to a new destination, environmental conditions can also be considered as push or pull factors for migrants (McKee et al., 2015; Phillmann, 2007; Rigaud et al., 2018).

Within the new economics of migration theory, migration is a collective household decision to support the larger unit (Stark and Bloom, 1985). This theory aligns with various forms of environmental migration, since decisions regarding migration, taken as a whole, are often in response to environmental factors or stressors (Phillmann, 2007).

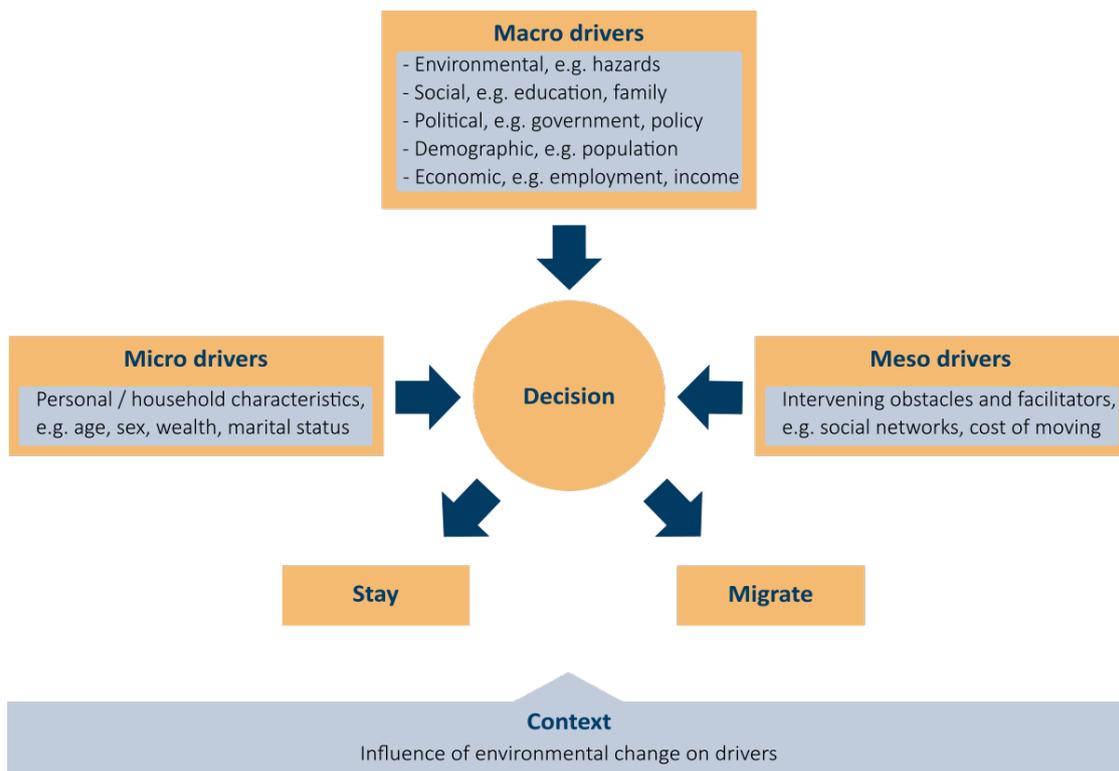
The world systems theory (Wallerstein, 1976) and the migration systems theory both understand that (international) migration flows result from wealth that is unequally distributed between the global North and South, including the exploitation of natural resources. Environmental issues are therefore already included in these theories. Since climate change has historically been caused mostly by industrialised countries of the Global North, climate migration can be seen as a response to environmental injustice (Christian Aid, 2007; Richards and Bradshaw, 2017).

The theory of aspirations and capabilities focuses on an individual's decision whether or not to migrate. Environmental issues can influence individual aspirations and capabilities, though in this theory they are not considered a driver of migration (de Haas, 2011).

The Foresight Framework on environmental migration (Figure 1) combines some elements of the above-mentioned theories. However, in this framework, climate change is considered an indirect driver that influences the direct drivers of migration, which lie mostly in the socioeconomic realm (Foresight, 2011).

Another important debate is about voluntary and forced migration and the suitability of these terms (Erdal and Oeppen, 2018; Hugo, 1996; King, 2006). Findings indicate that people in the midst of conflicts have to take quicker decisions, and displaced people face more acute risks and are more vulnerable than other migrants (Castles, 2003). Migration can range from completely voluntary to forced (Hugo, 1996).

**Figure 1** The Foresight Framework



Source: Adapted from Foresight (2011)

As climate change increases the frequency, intensity, and impacts of extreme weather events, coping, adapting, and building resilience will all be strategies in migration. Coping describes immediate, typically ex-post, short-term actions to manage stressful situations and disasters, as well as reactions to already existing climatic extremes. Adaptation describes the long-term proactive strategies that focus on the increasing risks and disasters in the future and tries to prevent or mitigate those (IPCC, 2012). These processes can influence the decision to migrate. Migration can be a strategy for adapting to climate change (Nawrotzki and DeWaard, 2018). Building resilience is defined as increasing “the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a potentially hazardous event in a timely and efficient manner” (IPCC, 2012). Migration can therefore also include aspects of resilience-building (Foresight, 2011).

### 3. FACTORS INFLUENCING CLIMATE MIGRATION

The relevant climate factors influencing migration depend on the specific context (e.g. the type of climatic region or livelihood strategies of the inhabitants) and may result in different types of migration (e.g. forced or voluntary). Several geographical and socio-economic contexts can be identified where climate drivers are associated with migration in different ways. These include:

*Smallholder agriculture and the agricultural pathway:* Climate change can affect agricultural productivity in ways that might cause people to migrate (Gray and Mueller, 2012; Mueller et al., 2014; Nawrotzki and Bakhtsiyarava, 2017). Development interventions in this area are varied and mostly technical, but do not necessarily address the structural inequities or failures that cause migration (Bita and Gerats, 2013; Ribot, 2010).

*Coastal areas:* Climate migration can be driven by rising sea-level, coastal flooding, and erosion (Wrathall et al., 2019). There are numerous development interventions in coastal areas, such as dykes or early warning systems (Lebel et al., 2002; Lu et al., 2016). However, there is evidence that planned relocation of affected inhabitants can be the best option in areas exposed to recurring flooding (Hino et al., 2017).

*Drylands:* Climate impacts on drylands include prolonged periods of drought, gaps in the rainy season, and extreme rainfall and flooding events. Drylands can be inhabited by pastoralist communities, who are often mobile (Traore and Owiyo, 2013; Wiederkehr et al., 2018). In order to improve adaptation, the mobility and communal land tenure of such communities should be recognised and protected, and the infrastructure (e.g. road networks, accessible livestock markets) improved (Nassef et al., 2009).

*Mountainous areas:* Climate impacts in mountainous areas include glacier melt, landslides, and flash floods. Evidence for migration is context specific. Migration can be an adaptation strategy. In some cases, migration can be the last option as mountain regions become uninhabitable. The successful implementation of adaptation measures depends on the accessibility of the region and can be achieved, for instance, by high-mountain dams and reservoirs (Brandt et al., 2016; Zoomers, 2012).

*Forests:* Forests have rarely been studied in terms of climate migration and are understood mostly as barriers to, rather than sources of, migration (de Sherbinin et al., 2007; Jones et al., 2018). One possible explanation is that forests have not been as affected by climate impacts as other ecosystems. However, since deforestation, droughts, and forest fires are increasing, forests will likely become less habitable in the future (Fearnside, 2004; Gerwing, 2002; Nawrotzki et al., 2014). To our knowledge, development cooperation is not yet engaging in adaptation strategies related to migration and forests.

*Urban areas:* Urban areas are increasingly affected by climate change. This might result in extreme droughts and water shortages, as in Sao Paulo (2015) or Chennai (2019), or in floods, such as those that affected large parts of Bangkok (2011, 2018) and Jakarta (2019). While the scientific community focuses on climatic impacts on cities, or migration to urban areas, there is a scarcity of evidence in the literature on climate-driven out-migration from cities. The existing literature suggests that only wealthier people may be leaving cities (Izazola et al., 1998; Liu-Farrer, 2016), and that there are many adaptation strategies for urban areas that consider climatic impacts but are not targeted at reducing migration (Rosenzweig et al., 2018).

As has been shown in many ecosystems, migration constitutes only one possible strategy in climate change adaptation and is not the most common (Wiederkehr et al., 2018). The question remains: why don't more people migrate in the face of adverse impacts from climatic events? Furthermore, people migrating due to certain climatic events may be exposed to other equally serious threats elsewhere (de Sherbinin et al., 2012; Geddes et al., 2012).

## 4. INSTRUMENTS OF DEVELOPMENT COOPERATION

Migration is acknowledged in the Sustainable Development Goals (SDGs) as both a driver of development and a potential source of vulnerability. Migration often results in human development gains, yet those who stand to gain the most – the poor, less educated, and more vulnerable – often face the greatest barriers to movement (UNDP, 2009). Although migration is an integral part of development processes, development actors have often tried to motivate people to stay in their place of origin, fearing that migration would cause a “brain drain” in the origin society and create tension in places of destination. Migration in general was perceived as a failure of development measures (Black and Sward, 2009; Le Coz and Soto, 2021). This rather negative view became more positive in the 2000s. For example, actors began to recognise the value that migration can bring both to migrants and their families and to origin and destination societies (UNDP, 2009). As the United Nations started to link migration and development and the possibilities of creating win-win situations for both origin and destination societies, policy agendas also started focusing on this approach (GCIM, 2005). Development actors have deployed a suite of interventions on migration and development, a snapshot of which is captured in Table 1.

**Table 1** Development “toolbox” along the migration cycle

Place of origin	Migration process	Connection between origin and destination		Destination	
Root causes/prevention	Return and reintegration	Migration process/transit	Remittances and diaspora	Migration governance	Reception and inclusion
<ul style="list-style-type: none"> <li>• Conflict prevention</li> <li>• Peacebuilding</li> <li>• Resilience-building</li> <li>• Employment and livelihoods support</li> <li>• Support for rule of law (anti-corruption) and human rights</li> </ul>	<ul style="list-style-type: none"> <li>• Vocational training</li> <li>• Access to livelihoods</li> <li>• Portability of pensions</li> <li>• Psycho-social support</li> </ul>	<ul style="list-style-type: none"> <li>• Migration information</li> <li>• Pre-departure training</li> <li>• Fair/ethical recruitment</li> <li>• Skills development, certification and transferability</li> <li>• Protection of migrant workers' rights</li> </ul>	<ul style="list-style-type: none"> <li>• Information on remittance costs</li> <li>• Reduction of transfer costs</li> <li>• Fund-matching schemes</li> <li>• Support for diaspora trade and investment</li> <li>• Temporary return and knowledge transfer</li> </ul>	<ul style="list-style-type: none"> <li>• Migration statistics</li> <li>• Migration policy development</li> <li>• Border management</li> <li>• Anti-trafficking</li> <li>• Mainstreaming migration into development planning</li> </ul>	<ul style="list-style-type: none"> <li>• Access to services (health, education)</li> <li>• Vocational training</li> <li>• Access to livelihoods</li> <li>• Psycho-social support</li> <li>• Participation</li> </ul>

Source: own figure

Climate migration takes place at international levels, but more often internally within countries (Mueller et al., 2014). A growing number of studies focus on the nexus between climate change and the role of migration in adaptation (Boas et al., 2019). Development cooperation actors have begun working on projects that harness its benefits (e.g. remittances) and minimise the risks of uncoordinated settlement. The question is whether – or to what extent – their existing migration and development toolbox can be useful in addressing migration caused by climate change.

Adaptation to climate change is set within a broad policy landscape and is mostly guided by the recommendations of international climate and disaster risk-reduction frameworks such as the Paris Agreement and Sendai Framework of 2016. International migration is also addressed by those concerned about human rights, legal issues, and economic concerns, as reflected in the Global Compact for Safe, Orderly and Regular Migration (GCM) (UN, 2018). As far as internal migration is concerned, the New Urban Agenda provides an important framework. While the absence of an integrated approach to migration and CCA hampers cooperation, the varied ways in which it is addressed makes a diverse set of tools available.

There are five areas of activities with regard to human mobility in the context of climate change: 1) the place of origin, 2) the migration process, 3) the connection between origin and destination, 4) the destination, and

5) the context, such as policies, laws and culture. Within these, there are mainly four categories of development approaches that can be distinguished regarding human mobility in the context of climate change. The first category includes local adaptation and resilience strategies to prevent displacement (World Bank, 2019). The second category covers preventive or post-disaster resettlement (de Sherbinin et al., 2011; Ferris, 2014; Yonetani, 2018). It is important that these resettlement strategies are planned carefully and thoroughly in order for them to be sustainable and successful for both the affected and the receiving communities (Chun, 2015; Koskinen-Lewis et al., 2016). A third category describes activities to mitigate the effects of displacement (IOM, 2017; World Bank, 2019). In recent years, governments have called on development actors to work alongside humanitarian actors in supporting countries and communities that host large refugee and displaced populations, not least to prevent onward movements (Furness and Gänzle, 2016). The fourth category focuses on facilitating migration as a form of adaptation strategy. A limitation on development actors' involvement in facilitating international migration is that the responsibility for admission policies generally lies with ministries of the interior. Therefore, the focus of interventions tends to be on supporting improved governance of climate migration among countries and within regions in the South (Black and Sward, 2009; Wood, 2019). Exemplary programmes have been devised by the World Bank and the EU (Oakes et al., 2016; World Bank, 2019).

## 5. FUTURE PROSPECTS

The discourse on climate-induced migration is divided into two major camps. The maximalists (mainly natural scientists) expect higher numbers of migrants due to climate change, while the minimalists (mainly social scientists) consider climate change as only one of many aspects that increase migration (DFID, 2009; Morrissey, 2009; van der Land et al., 2018). Minimalists consider a focus on climate change as potentially disguising drivers of migration that arise from underlying structures of the political and economic systems (Ribot et al., 2020).

While it is not possible to determine the exact number of people who will migrate in the future, recent models predict that between 190 and 630 million people will be displaced by the year 2100 (Kulp and Strauss, 2019). In the destination areas, possible conflicts between local residents and migrants over resources might emerge (Reuveny, 2007).

However, although the global migration rate remains stable at 3 percent of the world's population (Abel and Sander, 2014) and climate change is not a major driver of migration (Foresight, 2011; Ribot et al., 2020), public opinion is strongly influenced by the media, which tend to over-emphasise the role of climate factors in migration decision making (e.g. (Lustgarten, 2020)). This can lead to political responses that are based on subjective perceptions rather than on objective facts (Boas et al., 2019; Hartmann, 2010).

Policy makers can allocate resources by identifying the main centres of out-migration, especially coastal areas with agriculture that are vulnerable to sea-level rise, but also drylands and mountainous areas (de Sherbinin, 2014; Warner et al., 2009). It is equally important to identify the destination regions of climate-induced migration. Climate mobility will mostly take place within countries (Mueller et al., 2014), although some international mobility will also occur (Nawrotzki et al., 2016a). However, the probability of people migrating to areas exposed to climate risk is just as high as the probability of them leaving such places (de Sherbinin et al., 2012). For example, the megacities Dhaka and Lagos are rapidly growing, mainly because of promising labour opportunities, though they may also be exposed to a high climate risk (Black et al., 2011). There is also a high risk of involuntary immobility, whereby the poorest and most vulnerable become immobilised as climate conditions worsen (Shah, 2020).

## 6. CONCLUSIONS AND POLICY IMPLICATIONS

Addressing the challenges of climate migration requires political solutions. Development actors can adopt the role of the facilitator, for example by supporting cooperation or creating safe spaces. Their current approach is mostly shaped by political attitudes and focused on preventing emigration from countries of origin. However, there is evidence that development cooperation actors cannot effectively contain climate migration flows in countries of origin (Clemens and Postel, 2018). Throughout the entire spectrum of migration, there are many opportunities for development actors to intervene. The following areas require more attention:

*Finance:* Since adaptation generally lacks sufficient funding, development actors may need to focus more on finance (Chan and Amerasinghe, 2018). Specifically, the following financing activities need to be supported: proposing innovative financing to provide highly indebted countries with the chance to invest in climate adaptation (Mitchell, 2015), mobilising resources via twin-bonds (Wennubst et al., 2019), supporting partner countries to include climate-risk lenses in their strategies (Chan and Amerasinghe, 2018), and creating financial products and instruments with which to invest in resilient infrastructure (Plaza, 2019).

*Governance:* Bad governance such as lack of accountability and corruption are possible push factors encouraging people to move (Kirwin and Anderson, 2018; UNDP, 2019). Therefore, a focus by development actors on improving governance often leads to a reduction in emigration rates, while economic and social aid have no evident link to emigration (Gamso and Yuldashev, 2017). Development actors can support good governance and the involvement of the population in shaping the changes resulting from climate crisis and action so that people's needs are placed at the centre of the strategies (UNDP, 2019).

*Coherence:* As disasters are often human-induced, and in many cases caused by poor planning or development choices, coherent strategies linking climate action and development projects are important (de Haas, 2020). For development actors, it is important to align climate action (both, mitigation and adaptation) with development projects in order to avoid the most vulnerable and marginalised people experiencing unintended short- and long-term negative side-effects that might affect their decision to migrate.

*Devolution:* As urban centres are often the main targets of climate-related mobility (Rigaud et al., 2018), development strategies need to focus on sustainable urbanisation and urban development, placing marginalised people living in the informal settlements at the centre of consideration (de Sherbinin et al., 2007; Gemenne et al., 2020). As the existence of social institutions has been proven to augment resilience (Adger et al., 2011; Trzaska et al., 2017), a focus on existing social networks could be important.

*Innovation:* In order to establish proactive and innovative approaches to migration dynamics, a wider range of perspectives and more cooperation across jurisdictions and national borders are needed (Greiner et al., 2015). Moreover, managing climate migration requires institutional innovation (Clemens and Postel, 2018). Development actors can support the establishment of new institutional networks capable of dealing with migration dynamics, involving relevant actors in order to strengthen solidarity.

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