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Climate change and migration in developing countries: evidence and implications for PRISE countries

Maria Waldinger and Sam Fankhauser

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This policy paper is intended to inform decision-makers in the public, private and third sectors. It has been reviewed by at least two internal referees before publication. The views expressed in this paper represent those of the author(s) and do not necessarily represent those of the host institutions or funders.



Climate change and migration in developing countries: evidence and implications for PRISE countries

Policy Paper



Grantham Research Institute on
Climate Change and
the Environment



PRISE

Pathways to resilience
in semi-arid economies

Research for climate-resilient futures

Climate change and migration in developing countries: evidence and implications for PRISE countries

October 2015

Maria Waldinger

Sam Fankhauser

This report has been produced as part of a series of preliminary papers to guide the long-term research agenda of the Pathways to Resilience in Semi-arid Economies (PRISE) project. PRISE is a five-year, multi-country research project that generates new knowledge about how economic development in semi-arid regions can be made more equitable and resilient to climate change.

Front cover image:

Pakistan relief efforts continue

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1. Summary and introduction

This paper informs the development community about the effects of climate change on migration patterns within and out of developing countries. It concentrates on the *economic* aspects of migration and on information that is relevant for the six *semi-arid countries* that are the focus of the PRISE (Pathways to Resilience in Semi-Arid Economies) project: Burkina Faso, Senegal, Kenya, Tanzania, Pakistan and Tajikistan. The insights are drawn from a broader review of the evidence by Waldinger (2015).

The empirical evidence shows that people in developing countries are likely to respond to climatic change by migrating internally. There is less evidence on the relationship between climate change and international migration.

The effect of climate change on migration depends crucially on socio-economic, political, and institutional conditions. These conditions affect both vulnerability to climate change and how important climate change is in determining migration decisions.

People working in the agricultural sector are particularly affected by short-term climate shocks (droughts, flooding etc.) and long-term climate change. There is evidence of this from **Tanzania** and many other countries (CCCS 2014). Their vulnerability, however, depends on their ability to adapt to these changes, for example through the use of new crop varieties, as well as through non-agricultural activities, such as consumption smoothing through access to credit, insurance and social safety nets.

Migration has been a frequent response to climate variability and change in the past. There is strong

evidence of this, for example in the **Sahel** region of West Africa (Scheffran et al., 2012a, 2012b). Migration might also be an effective response to the climate risks of the future, but only under certain pre-conditions.

Access to information on the economic and social costs of migration, on the advantage and disadvantages of potential destination locations, and the absence of credit constraints can help potential migrants make decisions that will improve their livelihoods. The economy of **Tajikistan**, for example, is benefitting from the remittances of migrant workers abroad (World Bank, 2014).

Policy intervention is required to reduce potential negative impacts in both the sending and receiving region. Badly managed migration is associated with high economic, social and psychological costs. Nor will climate risks at the destination necessarily be lower, as the example of **Senegal** shows (Foresight, 2011).

Planned, proactive migration may be a necessary and effective response to climate risks. Uncoordinated distress migration is a sign of adaptation failure. To ensure effective migration choices and a good management of the wider socio-economic effects, policy-makers should:

- Provide sufficient information about the costs and benefits of migrating, including psychological and social, along with more clarity about alternative adaptation options.
- Release credit constraints, present in all PRISE countries and in particular in Senegal and Tajikistan, to offset the up-front costs incurred by potential

migrants, particularly high in areas with poor transportation infrastructure.

- Improve institutional quality to ensure the incentives to migrate are not reduced, in particular in the context of land tenure security when people are not able to sell their land or are not confident of reclaiming it upon return.
- Define the legal status of environmental migrants, for example, through a process led by the UN or UNHCR, in order to give people certainty about their legal situation.
- Put in place safeguards against distress migration, for example in the event of conflict, which can force people to choose sub-optimal migration strategies, leading to maladaptation.
- Support the areas affected by outward migration by promoting links between migrants and their region of origin; “managed retreat” from severely affected regions may be a last resort if they become inhospitable.
- Support the absorptive capacity of the receiving jurisdictions, in particular urban labour markets and public services, to manage the socio-economic implications of the arrival of migrants in a new destination.
- Direct migrants away from environmentally vulnerable areas where they move to for different reasons, as is the case in Senegal where more than 40 per cent of new migrant populations are located in high risk flood zones.



The chat. Dakar, Senegal

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2. Important concepts

2.1 Forms of migration

Migrants choose destinations and duration based on existing networks, skill levels, credit constraints and travel costs. We can distinguish many forms of migration:

- Depending on the destination: International and internal migration
- Depending on duration: seasonal migration, medium-term, and permanent migration

- Depending on the reasons: Climate migrants, economic migrants, political migrants, social migrants
- Depending on the underlying choice: forced migration and voluntary migration
- Depending on development outcome: productive and unproductive migration

Migration in all its forms is a prominent feature in the semi-arid lands of Burkina Faso, Kenya, Pakistan, Senegal, Tajikistan and Tanzania (see Table 1). Internal and seasonal migration has always been and continues to be an important response to climate

stress. Urbanisation trends are also prominent in all six countries. In **Senegal**, more than 40 per cent of the population now lives in urban areas.

In terms of international migration, the number of emigrants significantly exceeds the number of immigrants. Particularly in **Kenya**, but also **Pakistan, Senegal** and **Tanzania** a large fraction of emigrants are highly educated, creating a problem of human capital flight or “brain” drain”. On the other hand, expatriate communities often generate substantial remittances, on which the domestic economy relies.

Table 1: Population, urbanisation and migration trends in PRISE countries

	Population growth (%)	Urban population (%)	Urban population growth (%)	Emigrants w. tertiary education (%)	Net migration (total)
Burkina Faso	2.8	28.19	5.9	2.6	-125,000
Kenya	2.7	24.78	4.4	38.5	-50,000
Pakistan	1.7	37.86	2.8	12.7	-1,635,000
Senegal	2.9	43.08	3.7	17.2	-100,000
Tajikistan	2.5	26.62	2.7	0.6	-100,000
Tanzania	3.0	30.20	5.4	12.1	-150,000
SS Africa	2.7	36.65	4.1	12.6	
South Asia	1.3	32.19	2.6	5.4	
World	1.2	53.00	2.1	5.4	

* Negative numbers denote net emigration ; positive numbers denote net immigration

Source: Castells-Quintana et al. (2015). Data are for 2013 or closest year.

2.2 Environmental refugees

Different terms are applied to those moving for environmental reasons, including environmental or climate refugee and environmental or climate migrant. Broadly speaking environmental refugees leave their

place of residency because of sudden environmental change, whereas environmental migrants leave due to gradual, long-term climatic change (Keane, 2004).

In international law, the status of people leaving their place of residency due to environmental reasons remains undefined. Legally speaking, the term ‘environmental refugee’ is a misnomer. One reason

for the lack of definition is the difficulty of isolating environmental factors from other (often related) drivers of migration.

In this policy note we are concerned with migration decisions by people confronted with gradual environmental change, and focus less on people forced to leave by sudden environmental shocks and natural disasters.

3. The impact of climate change on migration

3.1 Reasons to migrate

Reasons for migration are very diverse. Typically, migration decisions cannot be traced back to only one category of causes. Instead, different causes interact and form the basis for migration decision.

Important causes include economic, political and social factors. Environmental causes increase economic incentives for migration, especially if they directly affect incomes.

3.2 Climate effects on migration I: via income

One of the most important drivers of migration patterns across the world are differences in income levels. If a person expects that their income or living standards more generally would increase by moving to another place or country, then they have incentives to do so (e.g. Borjas, 2014).

Hence, in cases where climate change affects current or future income or living standards, it may affect decisions to migrate.

Climate change may increase incentives for migration by increasing income differentials. Climate events affect livelihoods through their effect on agricultural productivity (e.g. CCCS 2014 on **Tanzania**; also Burgess et al., 2014; Guerrero Compean, 2013) and possibly through effects on non-agricultural income (e.g.,

Mueller et al., 2014 for **Pakistan**). Persistent drought in the **Sahel** has been identified as a key contributor to increased migration pressure (Scheffran et al., 2012a, b). In **Burkina Faso**, drier regions are more likely to engage in rural–rural migration, both temporary and permanent, than regions with more rainfall (Henry et al., 2004).

Climate change may reduce incentives for migration by lowering income from agriculture and exacerbating credit constraints of potential migrants. As a result, the poorest and most vulnerable may be unable to migrate because they lack the necessary resources; they are trapped (Gray and Mueller, 2012; Dustmann and Okatenko, 2014; Robalino et al., 2014). In **Burkina Faso**, long-distance or international migration appears to be limited to years of high agricultural productivity (Henry et al., 2004).

3.3 Climate effects on migration II: via conflict

The relationship between climate change and conflict remains highly controversial because the relationship is highly complex and heavily dependent on a country's socio-economic, institutional, and political characteristics.

Many developing countries are relatively dependent on agriculture and their political institutions often have limited ability to cope with economic or climate-related shocks. Financial markets, social safety nets or insurance systems are often weakly developed. This, combined with sometimes weak political,

economic and institutional structures, limits capacity to manage and recover from shocks.

There is evidence of specific historical cases where changes in climatic conditions increased pressure on resources and led to violence. It has been argued that historic persecution of Jewish communities in Europe often coincided with times of economic distress (Oster, 2004; Anderson et al., 2013) and that rural uprisings in China increased during periods of higher drought frequency (Jia, 2014).

There is some (although contested) evidence on the link between climate, economic shocks and conflict today (Miguel et al., 2004; Burke et al., 2014). For example, the conflict in Syria has coincided with a record drought in the Fertile Crescent, which was made two to three times more likely by climate change (Kelley et al., 2015). However, “climatic conditions are neither necessary nor sufficient for conflicts to occur” (Burke et al., 2014).

3.4 Empirical evidence on climate and migration

Climate variability has well documented effects on *internal* migration (Marchiori et al., 2011; Barrios et al., 2006). For example, a decline in precipitation in Africa increased rural to urban migration within sub-Saharan African countries (Barrios et al., 2006; Henderson et al. 2014). Frequent incidences of climate disasters are also known to trigger distress migration (Qaisrani, 2014).

In most sub-Saharan Africa economies rain-fed agriculture is very important. Changes in rainfall therefore have a critical effect on income from agriculture. Barrios et al. (2006) find that decline in rainfall can lead to increases in rural to urban migration (also Findley 1994).

There is limited evidence about the effect of climate on *international* migration. Compared to the number of people in developing countries engaging in internal migration the number of people engaging in international migration is small (Piguet et al., 2011).

Beine and Parsons (2014) examine the effect of long- and short-term temperature changes on migration empirically. They do not find evidence for an effect of climate on migration, but do find strong evidence for conflict to affect migration.

3.5 Historical evidence on climate and migration

Human populations have been exposed to substantial climatic change in the past. Archaeological evidence indicates that these have led to important shifts in human populations.

- A 200-year drought in the Indus Valley led to the abandonment of the urban centres of the Harrapan Society, now in Pakistan (Marris, 2014).
- During the African Humid Period (ca. 9000 to 6000 years ago) the Sahara was home to lakes and vegetation (Claussen et al., 2003). This enabled inhabitants of the Sahel region to enter and cross the area, and reach Europe and Asia.
- Humid conditions and increased vegetation in the Central Sahara/Sahel region in the pre-historic period (e.g.

195,000 and 120,000–110,000 years ago) coincided with periods of human expansion into this region (Castaneda et al., 2009).

Past episodes of climate change are not necessarily good guides to the future. Studies of climate change-induced migration forecast large streams of migrants (e.g. Myers 2002; Orach 2009, as quoted in Qaisrani 2014), but the underlying evidence is often weak. For a given shock, less migration may result compared to historical times because international borders and international laws limit migration. Increased migration could occur because of lower transportation costs and greater availability of information.

“There is limited evidence about the effect of climate on international migration. Compared to the number of people in developing countries engaging in internal migration the number of people engaging in international migration is small.”

4. The economic effects of migration on developing countries

4.1 Internal migration

Through internal migration, households seek to diversify their portfolio of economic activities in order to ensure survival or to improve their standards of living (Ellis, 1998). Migration is used as a risk management strategy. In **Burkina Faso** labour migration has been an off-farm livelihood strategy for drought-affected farmers since the 1970s (Nielsen and Reenberg, 2010).

Empirical evidence shows the positive economic effects of internal migration on income. In **Tanzania**, migration added 36 percentage points to consumption growth between 1991 and 2004, according to one study (Beegle et al., 2011).

However, positive effects depend on the receiving province's characteristics. Benefits of internal migration only arise under certain conditions. Income inequality is reduced only through migration to provinces with growing industries and labor markets (Phan and

Coxhead, 2010). Other conditions for beneficial migration include:

- Access to community networks for finding jobs in urban areas
- Access to transportation infrastructure
- Information on potential returns to labour in distant markets
- Land tenure security: the risk of expropriation deters rural-urban migration
- Access to credit.

4.2 International migration

The economic effects of international migration on households in developing countries and developing countries' economies can be both positive and negative.

On the positive side, international migration often creates additional income from remittances. In **Tajikistan**, for example, remittances now account for over 50 per cent of GDP – the highest

share anywhere in the world (World Bank, 2014). International migration can also extend business networks, and there are benefits from returning migrants who have acquired capital and skills abroad.

However, benefits only materialise if migrants remain in contact with their sending community, for example, through remittances.

On the negative side, skilled migrant are net fiscal contributors and their departure therefore represents a loss for those left behind. Skilled labour attracts foreign direct investments and R&D activities and its absence may therefore reduce these beneficial flows (Docquier and Rapoport, 2008).

Skilled and unskilled labour are also complements in the production process. Loss of skilled labour may decrease productivity (and wages) of unskilled labour left behind and increase productivity (and wages) of skilled labour. As a result, inequality between skilled and unskilled labour may increase.



5. Policy recommendations

Whether the economic consequences of migration are positive or negative and whether migration allows people to adapt efficiently to climate change depend on an array of socio-economic, political and institutional conditions.

Migration can have positive economic effects if migrants go to productivity-enhancing areas. It can have negative economic effects if migrants go to areas where their labour force is not efficiently employed.

Public policy can help to encourage positive migration choices and reduce risks associated with migration. The policy conditions needed to ensure effective migration choices are fairly generic, and apply to PRISE countries as well as more broadly. They include:

- **Clarity about alternative adaptation options:** Migration is not the only strategy to adapt to climate change. Migration becomes a viable choice when its costs and benefits compare favourably to those of other adaptation options. To make that comparison the full costs and benefits of migration choices need to be understood, including psychological and social costs. For example, migration is a highly gender-specific process, with most migrants being young men, which may disturb social processes such as family formation (on split family migration in **Kenya** see Agesa and Kim, 2001).
- **Sufficient information:** Insufficient information on potential costs and benefits of migrating to certain destinations can lead to inefficient migration decisions. Migrants may incur

the costs of migration but overestimate economic opportunities (Bryan et al., 2011; Munshi, 2003). In addition, taking into consideration all types of costs, be they economic, social or psychological, is an integral part of making an informed choice about migration. Migrant networks play an important role in transmitting such information (De Brauw and Harigaya, 2007; Bryan et al., 2011; Munshi, 2003).

- **No credit constraints:** Liquidity constraints lead to poverty-related labour immobility (Phan and Coxhead, 2010). Credit constraints can force people to take the 'wrong' migration decision because migrants incur up-front costs (transportation costs, costs from not working, set up costs in destination location). These costs are especially high in areas with poor transportation infrastructure and in areas with limited access to credit. Credit constraints are present in all PRISE countries, but particularly prevalent in **Senegal** and **Tajikistan**, where fewer than six per cent of the adult population have bank accounts with a formal institution (Castells-Quintana et al. 2015).
- **Sufficient institutional quality:** People may choose not to migrate even if they would benefit from migration if inadequate institutions reduce their incentives to do so. Land tenure security, for example, can affect incentives to migrate, if people are not able to sell their land or are not confident of reclaiming it upon return (Deininger and Jin, 2006;

Mullan et al., 2011; for a differentiated view see De Brauw and Mueller, 2012). Improved land tenure security also increases people's choice of alternative adaptation options. Alternatives may not be contemplated if an individual is unsure they will reap the benefits in the long term (Besley, 1995).

- **Clarity about legal status:** Until now, the legal situation of people migrating due to environmental reasons remains undefined (Keane, 2004). Environmental migrants do not have a legal status comparable to a refugee's legal status which would grant them legal protection to enter a country. The legal status of environmental migrants therefore needs to be defined, for example, through a process led by the UN or UNHCR, in order to give people certainty about their legal situation.
- **Safeguards against distress migration:** Unplanned migration in response to climate stress causes unnecessary hardship and economic loss. If "migrants are faced with death if they remain in their present place of residency," (Hugo, 1996), they often have no choice but to leave, irrespective of the productivity potential of origin and destination location. Conflict may also force people to choose sub-optimal locations regardless of their economic opportunities. These are signs of policy failure and maladaptation.

Policy-makers should also be aware of the wider socio-economic effects of private migration choices. Flanking measures may be needed

both in areas affected by outward migration and in the receiving jurisdictions.

- **Supporting areas affected by outward migration:** The effect of outward migration and ‘brain drain’, which is a concern in most PRISE countries (see Table 1) can be lessened by promoting links between migrants and their region of origin, for example, if migrants send remittances back home or return to invest newly-acquired capital or skills. However, if climate change makes certain areas inhospitable, voluntary migration may eventually give way to ‘managed retreat’. Such resettlement is a delicate process and the economic, psychological and social costs

of people being resettled are very high.

- **Supporting receiving jurisdictions:** Public policy can help manage the absorption process in receiving jurisdictions. The arrival of migrants poses important economic and social challenges. A receiving city’s labour market and infrastructure might not have the capacities to accommodate rapidly increasing numbers of people. If arriving migrants encounter problems entering the labour market or do not have access to public goods this will lead to economic and social problems. It is therefore crucial to strengthen the absorptive capacity of migration destinations, in particular urban

labour markets and public services.

- **Directing migrants away from environmental harm:** There may also be a need to direct migration movements to areas of decreased environmental risk. Many migrants move from environmentally vulnerable areas to areas that are equally vulnerable, albeit for different reasons. For example, in Dakar (**Senegal**), more than 40 per cent of new migrant populations are located in high-risk flood zones (Foresight, 2011). It is important to identify such migration movements and take measures to either redirect them or reduce the risks present in receiving areas.

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Research for climate-resilient futures

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