

Environmental migrants and social-movement participation

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Abstract

The displacement of people due to climatic changes (environmental migration) presents major societal and governance challenges. This article examines whether and how climate-induced rural-to-urban migration contributes to social-movement participation. We argue that the mainly forceful nature of relocation makes environmental migrants more likely to join and participate in social movements that promote migrant rights in urban areas. Using original survey data from Kenya, we find that individuals who had experienced several different types of severe climatic events at their previous location are more likely to join and participate in social movements. This finding has important policy implications. National and local authorities should not only provide immediate assistance and basic social services to environmental migrants in urban settings, but also facilitate permanent solutions by fostering their socio-economic and political integration in order to prevent urban conflict.

Keywords

climate change, Kenya, migration, social movements, survey, urbanization

The degree of urbanization¹ has sharply increased over the past few decades. While 751 million people lived in cities in 1950, the total urban population has grown to 4.2 billion by 2018, accounting for 55% of the world's inhabitants (United Nations, 2019). This number is expected to increase to 68% by 2050, adding another 2.5 billion people to urban areas with almost 90% of this increase taking place in Asia and Africa (United Nations, 2019). Traditionally, urbanization has been linked to reductions in poverty (Sekkat, 2017), inequality (Castells-Quintana & Royuela, 2015; Oyvat, 2016), or to the formation of agglomeration economies and

productivity gains, which, in turn, lead to greater national economic growth, particularly in less developed countries (Brühlhart & Sbergami, 2009; Bertinelli & Strobl, 2007).² Yet, rapid urbanization processes, when not managed well, can pose severe economic, social, political or environmental challenges, including strong pressure on the labor market, an inadequate provision of social services, such as health, education, housing and infrastructure, or water and energy systems. These challenges might subsequently trigger insecurity (Adger

¹ Urbanization (city growth) is caused mainly by rural–urban migration as well as natural population increase, geographic expansion of urban areas through annexations, and the transformation/reclassification of rural villages into small urban settlements (United Nations, 2019).

² Recent research shows that urbanization reduces economic growth especially in less developed counties (Frick & Rodríguez-Pose, 2018; Castells-Quintana, 2017).

et al., 2021) and ethnic hatreds (Gaikwad & Nellis, 2017) that could fuel social unrest and political violence (Koren, Bagozzi & Benson, 2021; Buhaug, Cederman & Gleditsch, 2014; Goldstone, 2002; Brennan, 1999; Gizewski & Homer-Dixon, 1995).

Climate change and environmental factors have the potential to contribute to this multifaceted relationship between urbanization and social unrest via their effect on migration. Climatic changes shape the decision of individuals to migrate or not (Cattaneo et al., 2019; Adger et al., 2018; Koubi et al., 2016). However, the exact impact of climatic changes on migration is determined in combination with numerous other micro, meso, and macro-level influences (Piguet, 2013; Black et al., 2011), which are themselves affected by climatic events (Foresight, 2011).³ Consequently, migration decisions in the presence of climatic changes are likely to vary (Black et al., 2011; see also Hunter, Luna & Norton, 2015) depending on individual factors (e.g. gender, age, and education), intervening obstacles/facilitators (e.g. social networks and technology), or country-level factors (e.g. social, political, and economic structures). Given the range and complexity of the interaction between these drivers, it is often difficult to isolate the impact of environmental factors on people's decisions to move (Black et al., 2011; Foresight, 2011). Nevertheless, although it is challenging to project the scale of future migration flows (Black et al., 2011), experts agree that millions of people, especially in sub-Saharan Africa, South Asia, and Latin America, could be forced to move within their countries in the medium term due to climatic changes (Rigaud et al., 2018). Moreover, these people are expected to move from rural to urban areas, contributing to a long-term global trend of increasing urbanization, especially in Asia and Africa (Rigaud et al., 2018; Henderson, Storeygard & Deichmann, 2017; Barrios, Bertinelli & Strobl, 2006). Therefore, climate change could aggravate the potential of urbanization to trigger social disorder by increasing the scale of already existing urbanization processes.⁴

In this article, we examine whether and how rural-to-urban migration induced by climatic changes affects migrants' willingness to join and participate in social movements aiming to eliminate discrimination against migrants in urban areas and thus to rectify their current

grievances.⁵ By social movements, we mean purposeful, organized groups that pursue a common goal aiming at creating social change, for example to provide a political voice to those otherwise disenfranchised, relying on non-violent and/or violent tactics (Little et al., 2014: Chapter 21; Chenoweth & Stephan, 2011). Focusing on the reasons that individuals become migrants in the first place, we analyze whether climate-induced migration motives affect the potential link between urbanization and social disorder, thus adding a new mechanism to this complex process. While climate change has the potential to trigger migration and, hence, contribute to urbanization growth, it might also affect the urbanization–social disorder relationship if environmental migrants exhibit some heightened propensity to join and participate in social movements that aim at improving the situation of migrants in these urban areas. We argue that the mainly forceful nature of environmental migration and the resulting grievances increase environmental migrants' likelihood to join and participate in social movements.⁶

We test our argument with original micro-level survey data from three cities in Kenya that comprise more than 2,400 migrants, allowing us to identify each individual's experience with climatic changes and whether they would be willing to join and participate in social movements that promote migrant rights in urban areas. While it is hardly possible to study 'actual behavior' using micro-level data, our empirical approach is designed to approximate such behavior as closely as possible. This work adds to existing literature in that we probe respondents' *behavioral intentions* by asking them about their willingness to join and participate in social movements in order to rectify

³ This framework of environmental migration thus integrates the more parsimonious push–pull theoretical approaches (Lee, 1966).

⁴ Bahgat, Buhaug & Urdal (2018) report that the total average annual number of disorder events occurring in major cities in developing countries doubled over the 2012–18 period.

⁵ Our work consequently contributes to the emerging literature – part of this special issue – that studies the links between climatic changes and low levels of conflict, such as protests or riots instead of civil conflict (see Ide, Kristensen & Bartusevičius, 2021; Koren, Bagozzi & Benson, 2021; Petrova, 2021).

⁶ While our argument is embedded in relative-deprivation theory, we are also aware that this theory has been criticized by resource-mobilization and political-process theorists who contend that grievances are ubiquitous and, hence, cannot explain participation in social movements (Tarrow, 2011; Tilly, 2003; Oberschall, 1994; Chenoweth & Ulfelder, 2017). These scholars instead emphasize structural variables for the formation of social movements including social organization, interest, resources, tactics and strategies, etc. Having said that, in the empirical analysis, we partially account for these literatures by asking interviewees whether they would be willing to join an existing migrant group that aims at eliminating discrimination against migrants.

potential disadvantages they face.⁷ We, thus, contribute to the climate-migration–urban social-disorder literature (e.g. Østby, 2016) and to the more recent literature on individual-level conflict perceptions, intentions, and conflict support (e.g. Koubi et al., 2018; Linke et al., 2018; Blair et al., 2013; Lyall, Blair & Kosuke, 2013).

Climate change and rural-to-urban migration

According to the Internal Displacement Monitoring Centre (IDMC), between 2008 and 2018, about 265 million people worldwide were internally displaced in response to disasters, for example storms, floods, or droughts. In comparison, this number is three times the number of people who were displaced by conflict (81 million; IDMC, 2019). Those who are forced to move due to climatic disasters often lose property, crops, and other resources. However, while displacement might be temporary for some people, the displacement is permanent for others as in the case of severe drought and desertification as well as sea-level rise, since such events ultimately force people to move to avoid grave deterioration in resources and potential risks to human lives. Moreover, although some individuals are forced to relocate across borders, the majority of migration in the context of environmental change actually occurs within countries' own borders (Rigaud et al., 2018; Afifi et al., 2016).

During the last decade, several studies have examined the impact of climatic changes on internal migration using macro-level (e.g. Call et al., 2017; Lu et al., 2016) and micro-level data (e.g. Bohra-Mishra et al., 2017; Koubi et al., 2016; Thiede & Gray, 2017; Mastorillo et al., 2016), as well as a diverse range of approaches. Empirical findings consistently show that sudden-onset climatic events such as floods and storms lead to migration (McLeman & Gemenne, 2018). The results regarding the effects of slow-onset events, such as droughts, on the other hand, remain mixed (IPCC SR

1.5, 2018; Adger et al., 2015; Hunter, Luna & Norton, 2015). More precisely, empirical evidence suggests that out-migration due to droughts increased as a result in Pakistan (Mueller, Gray & Kosec, 2014), Indonesia (Thiede & Gray, 2017), and Northern Ethiopia (Hermans & Garbe, 2019). Droughts, however, seem to have had insignificant effects in South America (Thiede, Gray & Mueller, 2016) and decreased the likelihood of migration in Peru, Uganda, Vietnam, and Cambodia (Koubi et al., 2016). Furthermore, other studies identify the effects of climate on migration as multidimensional and heterogeneous (Cattaneo et al., 2019; Hunter, Luna & Norton, 2015). For instance, droughts increase migration among black and poor individuals in South Africa (Mastorillo et al., 2016), and they seem to further rural-to-urban migration in Northern Latin America and the Caribbean (Baez et al., 2017a), and mostly for young females and young uneducated males in Central America (Baez et al., 2017b).

Similarly, existing research on the relationship between urbanization and the risk of political violence has yielded ambiguous evidence and our understanding of whether urbanization promotes or inhibits the risk of social disorder continues to be limited. Case studies provide some evidence for the urbanization–political violence nexus in Southeast Asia (Evers, 1975), Rwanda (Percival & Homer-Dixon, 1996), South Africa (Percival & Homer-Dixon, 1998), and Kenya (Kahl, 2006). Similarly, Cincotta, Engelman & Anastasion (2003) report that countries with rapid urbanization growth suffer from civil conflict.⁸ Quantitative studies, on the other hand, do not confirm that urban population growth leads to a higher risk or frequency of social disorder (Schulz, 2015; Buhaug & Urdal, 2013; Urdal & Hoelscher, 2009), although very populous cities tend to see unrest more often (Bahgat, Buhaug & Urdal, 2018). Furthermore, it seems that rural-to-urban migration per se, one of the principal reasons for rising levels of urbanization, does not contribute to political violence in urban settings (Østby, 2016).

Despite the surge in the number of studies on the potential link between environmental change, migration, and conflict, this literature is still far from reaching a consensus on this relationship. For example, while some

⁷ Ajzen (1991), for instance, sees behavior as directly determined by intentions, which is the will to make an effort to demonstrate the behavior in question. Furthermore, he argues that the stronger the intention to engage in a behavior, the more likely should be its performance. In addition, the execution of intentions depends on non-motivational factors such as availability of necessary opportunities and resources (Ajzen, 1985). Consequently, to the extent that a person has the required opportunities and resources, and intends to perform the behavior, she succeeds in doing so. In our survey, we present migrants with a hypothetical group that aims at eliminating discrimination against migrants, and ask them how willing they are to engage in order to support the group's goal.

⁸ It has been shown that the higher population density in urban areas makes popular mobilization easier by increasing the potential for collective action due to dense social networks, access to financial resources, and media information (Weidmann, 2009; Toft, 2003) and by undermining local governments' attempts to control the population (Wallace, 2014; Staniland, 2010).

scholars provide evidence that mass population movements induced by climatic shocks were an important factor leading to Syria's uprising and subsequent civil war (e.g. Ash & Obradovich, 2020; Kelley et al., 2015), others conclude that the occurring drought had little if any impact (Selby et al., 2017; Fröhlich, 2016). Moreover, limited and often ambiguous empirical evidence based on large-N studies further adds to the difficulty of deriving conclusive statements (e.g. Brzoska & Fröhlich, 2015). Reuveny (2007), for instance, shows that migration caused by extreme events can induce more conflict in receiving communities, while Raleigh, Jordan & Salehyan (2008) do not find a significant effect. Moreover, while Bhavnani & Lacina (2015) find that greater rates of internal migration due to climatic shocks are associated with a higher risk of riots in Indian states, Petrova (2021), as part of this special issue, reports that hazard-induced migration does not increase the risk of protests in migrant-receiving districts in Bangladesh. Similarly, Ghimire, Ferreira & Dorfman (2015) find that disaster-induced migration does not affect the risk of new conflict outbreaks, but it lengthens the duration of an existing civil conflict. Lastly, climatic changes seem to increase the risk of intercommunal violence, in Kenya and East Africa in general, by affecting pastoralists' strategies for access to water and foliage (Pas Schrijver, 2019; Detges, 2014; Adano et al., 2012; van Baalen & Mobjörk, 2018).

Finally, while long-term climatic events, such as droughts, seem to enhance environmental migrants' conflict perceptions in their destination location (Koubi et al., 2018), they may not add to their willingness to support violence (Linke et al., 2018). Migrants who experienced short-term climatic events, such as storms or heavy rains, on the other hand, are more likely to support violence if they were themselves victims of violence (Linke et al., 2018).

Explaining social disorder in light of environmental migration

While existing studies provide valuable insights into the complex link between climate, migration, and conflict, almost none of them explicitly examine the potential of climate-induced migration for social mobilization and urban social disorder (van Baalen & Mobjörk, 2018: 561). Moreover, essentially all relevant works focus on aggregated levels of analysis, for example the country or regional level, making it difficult to isolate the effect of climate shocks (for an exception, see e.g. Linke et al., 2018; Koubi et al., 2018). Hence, our understanding of the precise mechanisms underlying the relationship

between climate change, migration, and political violence remains limited (Mach et al., 2019, 2020), which hinders efforts to provide concrete policy recommendations regarding the security risks of environmental migration. In an effort to fill these gaps, we examine the effects of climate-induced rural-to-urban migration on social movements. We contend that the experience of a series of environmental events in a previous location shapes migrants' willingness to join and participate in social movements about migrant rights and, thus, contributes to urban social disorder. We develop this mechanism in several steps.

First, the mainly forceful displacement caused by environmental changes is likely to reduce migrants' willingness to adjust to their new location. Individuals are attached to their places (Adams & Adger, 2013), which involves an emotional connection to a particular place (Lewicka, 2011). Place attachment is generally stronger in rural than in urban areas because rural people choose their home or decide to stay based on factors other than the proximity to services and access to employment, such as culture and ancestors, which strengthen social capital and a sense of belonging (Anton & Lawrence, 2014; Lewicka, 2011). Relocation due to environmental changes, however, ruptures these emotions and the ensuing nostalgia and estrangement, which tends to outlast the physical relocation,⁹ can undermine the sense of belonging (Fullilove, 1996), making adjustment to a new place difficult (Fried, 1963).

Second, having been forced to leave their homes, environmental migrants are likely to consider themselves as uprooted, which cements a discourse and mindset of victimhood, injustice, grief, and anger. Such emotions promote risk acceptance and feelings of personal efficacy, which in turn encourage individuals to prioritize dignity and increase the willingness to engage in resistance (Pearlman, 2013). Indeed, recent research in social psychological injustice and relative deprivation shows that emotions play a crucial role in predicting collective action participation (van Stekelenburg & Klandermans, 2017; Pearlman, 2013). Similarly, grievance-based approaches in political science emphasize that actual or perceived injustice motivates individuals to join/participate in social movements (Gurr, 1970).¹⁰ Consequently,

⁹ Sen (2011) shows that grievances developed during the 19th-century Irish famine continue to live on in the minds of later generations.

¹⁰ The relative-deprivation proponents have not focused attention on social movements per se. They rather study episodes of political violence, which range from turmoil (e.g. violent strikes, riots, political

we expect that environmental migrants, due to emotions and grievances related to the environmental stimulus of their migration decision, are more likely to join and participate in social movements in their new urban location than migrants who had not experienced environmental changes in their previous location.

Third, the participation in social movements is not without costs (Tarrow, 2011; Tilly, 2003; Oberschall, 1994; Chenoweth & Stephan, 2011; Chenoweth & Ulfelder, 2017) and the experience of environmental events in a migrant's previous home must outweigh these for joining and participating in a social movement to occur. Hence, migrants' grievances and, consequently, their willingness to join social movements must be crucially shaped by climatic events. The literature typically distinguishes between different types of environmental events (e.g. Cattaneo et al., 2019; Koubi et al., 2016). On one hand, there are slow-moving events such as droughts or salinization, which develop slowly, over a long time horizon, and typically allow affected individuals and communities to adapt to shifting circumstances. Conversely, climatic changes, such as tropical storms and floods, occur suddenly and are often paired with severe destruction in a relatively short time span. The main difference between these two types of climate extremes – gradual and long-term changes vs. sudden and short-term events – is that the latter hardly allow for adaptation, and mostly affect all individuals equally negatively, severely, and rapidly. Sudden, short-term events often cause destruction on a large scale and 'people must flee to save their lives' (Warner, 2010: 405), but their potential to cause relative deprivation and grievances is rather limited.¹¹ Hence, despite their being more likely to force people to move, such sudden, short-term events should not in isolation necessarily result in heightened grievances that induce participation in social movements.

clashes, and localized rebellions) to internal war (e.g. large-scale terrorism and guerrilla wars, civil wars, and revolutions). Having said that, we believe that since most behaviors mentioned in the relative-deprivation literature under the 'turmoil' category qualify as 'social movement' activity, it is appropriate to base our argumentation on the motives of (environmental) migrants to join and participate in social movements on such theoretical approaches.

¹¹ Brzoska & Fröhlich (2016) contend that environmental migration due to sudden climatic events is not likely to lead to violent conflict in receiving areas because migrants of this type generally tend to return to their original home as soon as conditions allow it. Moreover, the large-scale availability of humanitarian assistance in such cases further alleviates immediate scarcities. Finally, environmental migrants of this type are not generally in a good position to organize violence, mainly due to the lack of social networks (see also Fröhlich, 2016).

For gradual climatic events, the ability to adapt varies across individuals, and relative deprivation can be induced when individuals do not observe any progress in their own current or future status despite efforts to deal with the climatic event (Davies, 1962; Gurr, 1970; see also Koubi et al., 2018). Thus, in contrast to sudden, short-term events, individuals facing gradual climatic events are on average less likely to migrate (Koubi et al., 2016), but more likely to develop grievances strong enough to make participation in social movements more likely (Koubi et al., 2018).

Fourth, to this end, we expect that the combination of *both* gradual and sudden events in their previous homes should make it most likely for individuals to overcome the costs of participation. The rationale is that when people are constantly exposed to deprivation and grievances over a long period (gradual events), the resulting grievances persist in the minds of migrants for a long time (Sen, 2011) and they can influence their social functioning as well as their perceptions regarding the mechanisms aiming at promoting justice and fairness (van Stekelenburg & Klandermans, 2017). If such relative deprivation and grievances are then coupled with climatic changes that do not allow for adaptation and hit all individuals equally negatively, severely, and rapidly to warrant migration to urban centers, individuals' situations might be affected negatively enough to result in social-movement participation. Such participation is then perceived as an opportunity to change a state of affairs for migrants living in urban areas that is presumably considered to be unfair and unjust at affordable costs (van Stekelenburg, Klandermans & van Dijk, 2009). Ultimately, we should thus observe an increased likelihood that these individuals, that is, environmental migrants who have suffered from both short-term and long-term environmental events in their previous homes, join and participate in social movements.

Research design

Our theoretical expectations are, against this background, that environmental migrants' experience with sudden and gradual events shapes their willingness to join and participate in social movements in their new urban location. Our empirical analysis is based on original face-to-face surveys with intrastate, rural-to-urban migrants in Kenya.¹² We selected Kenya due to its

¹² Social movements do not occur in a vacuum, but are rather context-dependent (van Stekelenburg, Klandermans & van Dijk, 2009). That is, the types of participants as well as mobilization

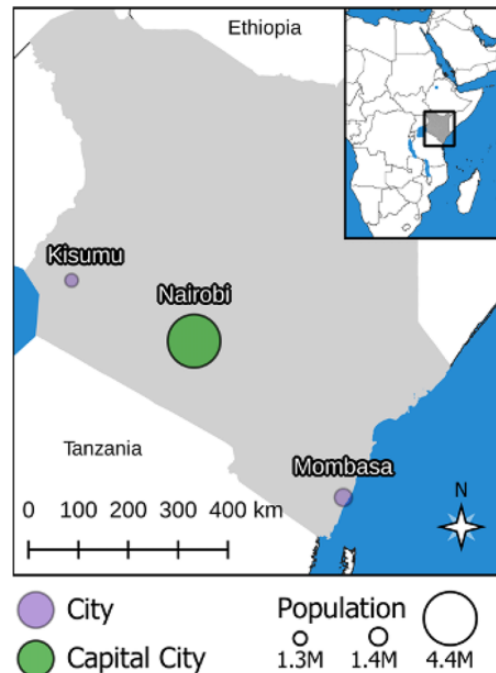


Figure 1. Surveyed cities and population in Kenya

exposure to extreme climate events and its high urbanization rate. Given our focus on rural-to-urban migration, we sought to include a country with high urbanization rates, which applies to Kenya (4.1%). Regarding vulnerability to climatic changes, Kenya ranks 151st out of 181 countries in the ND-GAIN index (2017) for the period 1995–2017, implying that Kenya is very vulnerable to climate change effects, but unprepared to combat these effectively. The country has been grappling with a persistent drought and related food insecurity since 2014 (ReliefWeb, 2019) and, in 2018, it ranked seventh among the top ten states most affected by extreme weather events in the Germanwatch Global Climate Risk Index (Eckstein et al., 2020). Heavy rains, which led to flooding in all of the country's 47 counties, not only caused substantial economic losses and a high number of deaths (Eckstein et al., 2020) but also forced 336,000 people to move away from their homes (IDMC, 2019).¹³

channels depend on the local context. Consequently, we account for such factors in our models.

¹³ While climatic events lead to internal migration in Kenya, it is worth noting that displacement has periodically resulted from other causes in this country, such as politically instigated violence (e.g. the 2007 disputed presidential elections), land and boundary disputes (e.g. related to colonial land dispossessions), development projects such as construction of dams, roads, and hydroelectric power plants, and environmental conservation projects (e.g. the conservation of the Mau forest).

Sampling

We surveyed migrants from three urban centers. We selected Nairobi, Mombasa, and Kisumu for our data collection that took place between January and March of 2019 (see Figure 1). We defined a respondent as a migrant if s/he was 16 to 65 years old, born in a rural area, came to live in the survey site when s/he was at least 16 years old, has stayed or intends to stay in the survey site for at least six months, and had lived in a rural area for one year or more just before moving to the survey site. To recruit respondents, we initially relied on previous surveys that had migrant populations in their sample. However, using this sampling frame turned out to be ineffective as information about the respondents' location was no longer updated: some individuals had either migrated again or passed away. Without a reliable sampling frame of migrant households in the selected survey sites, we therefore used a multistage convenience sampling design.¹⁴ Following this strategy, we collected data for 2,416 respondents. The survey was administered face-to-face using tablets. On average, it took respondents 35–40 minutes to complete the survey.

¹⁴ The Online appendix provides additional information on our sampling procedure.

Table I. Environmental motives behind rural-to-urban migration

	<i>Sudden event</i>	<i>Gradual event</i>	<i>Both events</i>	<i>No events</i>
No	1,831	2,121	1,039	2,257
Yes	585	295	1,377	159
Total	2,416	2,416	2,416	2,416

Variables

In what follows, we describe the key variables employed in the main analyses. The question wordings of the outcome variables we use are provided in the Online appendix. To determine whether a migrant belongs to the category of 'environmental migrants', we relied on respondents' perception of environmental events. In particular, we use a question that asks whether any of the following weather events had occurred during the year before they migrated: heavy rain, flood, hail, storms, cyclones, and landslides, which we all coded as (1) sudden events, while we coded drought and desertification as (2) gradual events. Since respondents could list more than one type of environmental event, we coded those respondents who said they experienced both sudden and gradual environmental events as (3) both types of environmental events. If the respondent did not list any environmental event in her response, we coded the respondent as a non-environmental migrant. Hence the different categories, 'sudden events only', 'gradual events only', 'both events', and 'no events' are mutually exclusive. Table I summarizes the types of (environmental) migrants in our sample across all three survey sites in Kenya. Out of 2,416 interviewees, 585 (about 24%) had suffered from and left due to sudden environmental events only, 295 (about 12%) individuals had experienced and fled gradual events only, while 1,377 people (about 57%) left their rural home and moved to a city as they encountered both sudden and gradual events. Note that 159 people in our sample (about 7%) migrated within Kenya for non-environmental reasons. The type of environmental migration is our key factor of interest as we contend that it shapes individuals' willingness to join in social movements as well as to participate in demonstrations and protests, and we use non-environmental migrants as our baseline category, left out of the models for comparison in the empirical analyses below.

To measure migrants' willingness to join and participate in social movements in their new location, we compiled data on three different yet interrelated concepts that we use in turn as dependent variables in our

Table II. Migrants' willingness to participate in social movements

	<i>Protests</i>	<i>Potentially violent protests</i>	<i>Movement membership</i>
No	883	2,031	2,061
Yes	1,533	385	355
Total	2,416	2,416	2,416

estimations. To this end, we presented respondents the following scenario:

Imagine there is a group of migrants living in <CITY> who feel that they are being treated differently in various areas, which is affecting their overall quality of life in <CITY> in a negative way. They have formed as a group with the aim to eliminate discrimination against migrants and organize various activities to help further their goals.

We then asked the respondents whether

- (1) they would be willing to participate in peaceful protest rallies organized by the group (*Protest*),
- (2) they would be willing to participate in protest rallies organized by the group even if these may cause violent clashes (*Potentially violent protests*), and
- (3) they would be willing to join the group (*Movement membership*).

Responses were coded on a 1 (very willing) to 5 (very unwilling) scale per item, which we recoded into binary measures with 1 capturing respondents who were either very or somewhat willing (values 1 and 2 of original variable) to protest, join potentially violent protests, or become a member in the group that aims at eliminating discrimination against migrants. As we seek to capture active members, interviewees must have also stated that they would be willing to participate in peaceful or potentially violent protest rallies. Table II gives an overview of the three outcome variables' distributions. Most of our respondents were indeed willing to participate in peaceful protest rallies (1,533 people, about 63%). If there was a risk of these demonstrations turning violent, either because of protesters or security forces engaging with them, only 385 out of 2,416 migrants signaled their willingness to protest (about 16%). The most engaging activity, namely membership in the movement and participating in protests, was attractive to only 355 people in our sample (about 15%). About 6% in our sample (143 respondents) were unwilling to participate in any of the three activities.

All three outcome variables are binary, which suggests that logistic regression may be an appropriate estimator. However, the structure of our data is more complex than it may seem initially. That is, our sampling procedure and data collection focused on three cities within Kenya, while migrants surveyed in each city may have migrated from any of the 47 counties within the country. Particularly controlling for the latter seems crucial due to certain regional factors that may have shaped an individual's migration decision in the first place. Hunter, Luna & Norton (2015: 5) also stress that 'a region's historical-political context' is likely to drive whether people migrate from their rural homes to urban centers. As a result, we employ multilevel mixed-effects logistic regression that comprises a city-level as well as a county-level intercept to account for unobserved heterogeneity at each level (Rabe-Hesketh & Skrondal, 2009). Both random intercepts are modeled according to a normal distribution (Gelman & Hill, 2007). Below and in the Online appendix, we explore alternative model specifications including fixed effects, block-bootstrapped standard errors, and clustered standard errors.

To control for confounding factors, we also collected information about migrants' sociodemographic characteristics, including their age, gender, education, income, and whether another household member had already migrated to a specific city before (1) or not (0). *Education* is measured on a 1–7 scale: the value of 1 stands for no education received, 2 refers to 'some primary education', 3 stands for 'primary school completed', 4 captures 'some secondary education', and 5 indicates whether a migrant completed secondary education. The values of 6 and 7 signify whether an individual had technical training after secondary school and university degrees, respectively. For the variable *Low income*, we asked individuals whether their income is currently enough to sustain a living. Response categories range from more than enough to far from enough. We generated a binary variable using this information and coded respondents who reported that their income was not really enough or far from enough as 1 (0 otherwise). Table III summarizes the descriptive statistics of our control variables.

Empirical findings

Tables IV, V, and VI summarize our main models. Table IV concentrates on the core explanatory variables of interest and omits the control covariates. Random intercepts for cities and counties are included in the three models, though. Migrants motivated by a sudden event, a gradual event, or both differ for many (unobserved)

Table III. Descriptive statistics of control variables

	<i>Obs.</i>	<i>Mean</i>	<i>Std. dev.</i>	<i>Min.</i>	<i>Max.</i>
Age	2,416	30.339	8.515	19	66
Male	2,416	0.463	0.499	0	1
Household migrated	2,416	0.755	0.430	0	1
Education	2,416	4.423	1.546	1	7
Low income	2,416	0.613	0.487	0	1

Table IV. Rural-to-urban environmental migration and social movements

	<i>Protests</i>	<i>Potentially violent protests</i>	<i>Movement membership</i>
Sudden event	0.330 [†] (0.185)	0.045 (0.283)	0.111 (0.289)
Gradual event	0.101 (0.202)	0.173 (0.307)	0.121 (0.315)
Both events	0.524** (0.175)	0.474 [†] (0.265)	0.446 [†] (0.272)
Log likelihood	-1,543.354	-1,047.080	-1,000.978

Table entries are coefficients from mixed-effects logistic regression; standard errors in parentheses; constant included in all models but omitted from presentation; random intercepts for cities (Kisumu, Mombasa, Nairobi) and counties included in all models; $N = 2,416$ in all models; 'no events experienced' is the baseline category left out for comparison.

[†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

reasons, which could point to a selection issue as discussed above. Some individuals may be more likely than others to have the time and skills to select suitable new places of residence, and thus select themselves to cities where more or fewer protests are common. Showing the results without controls could shed light on the nature of this selection problem, and we employ matching techniques in the Online appendix to address this issue further. Tables V and VI then comprise the control covariates, but they differ in what random intercepts are considered: the former incorporates a county-level random intercept only, while the latter has both a random intercept for cities and one for counties. We thus seek to demonstrate that while it is important to control for unobserved heterogeneity stemming from the different levels in our sample, including or omitting a specific random intercept does not affect the substance of our findings.

When comparing the results across Tables IV to VI, the main effects are quite consistent and stable. Hence, altering model specifications and the inclusion or exclusion of controls does not affect the substance of our

Table V. Rural-to-urban environmental migration and social movements: county intercept only

	<i>Protests</i>	<i>Potentially violent protests</i>	<i>Movement membership</i>
Sudden event	0.354 [†] (0.185)	0.078 (0.283)	0.127 (0.290)
Gradual event	0.135 (0.202)	0.211 (0.306)	0.153 (0.316)
Both events	0.633** (0.178)	0.494 [†] (0.268)	0.481 [†] (0.274)
Age	-0.014** (0.005)	-0.008 (0.007)	-0.013 [†] (0.007)
Male	0.260** (0.088)	0.014 (0.114)	0.005 (0.118)
Household migrated	-0.142 (0.102)	0.100 (0.134)	0.119 (0.139)
Education	0.062* (0.030)	-0.008 (0.039)	-0.006 (0.040)
Low income	0.105 (0.091)	-0.046 (0.118)	-0.120 (0.121)
Log likelihood	-1,549.713	-1,050.239	-999.635

Table entries are coefficients from mixed-effects logistic regression; standard errors in parentheses; constant included in all models but omitted from presentation; random intercepts for counties, but not cities included in all models; $N = 2,416$ in all models; 'no events experienced' is the baseline category left out for comparison.

[†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

findings. The key influence, against this background, both in terms of statistical significance and substance stems from the variable *Both events*. That is, if migrants experienced both sudden and gradual events in their previous homes, they are more likely to join protests, participate in rallies that could be violent, and join social movements fighting for the rights of migrants as members. *Both events* is statistically significant at conventional levels in all models across Tables IV to VI, which signifies a higher likelihood than migrants who have experienced none of the environmental events before (our baseline category for comparison) of participating in either activity captured by our outcome variables. As coefficients in mixed-effects logistic regression models do not allow for a direct reading of effect sizes, we also present substantive quantities of interest in Figures 2 and 3.

In Figure 2, we show marginal effects for our core predictors while holding the control covariates at their median. With regard to *Both events*, note that its confidence intervals do not overlap with an effect estimate of 0, thus distinguishing these environmental migrants from individuals who have not experienced and moved

Table VI. Rural-to-urban environmental migration and social movements: county and city intercept

	<i>Protests</i>	<i>Potentially violent protests</i>	<i>Movement membership</i>
Sudden event	0.358 [†] (0.187)	0.043 (0.284)	0.115 (0.290)
Gradual event	0.143 (0.204)	0.164 (0.308)	0.118 (0.316)
Both events	0.595** (0.179)	0.477 [†] (0.268)	0.465 [†] (0.274)
Age	-0.014** (0.005)	-0.008 (0.007)	-0.013 [†] (0.007)
Male	0.260** (0.091)	0.007 (0.115)	-0.003 (0.119)
Household migrated	-0.041 (0.105)	0.072 (0.136)	0.126 (0.140)
Education	0.071* (0.030)	-0.017 (0.039)	-0.007 (0.040)
Low income	0.198* (0.093)	-0.072 (0.119)	-0.121 (0.122)
Log likelihood	-1,528.431	-1,046.069	-999.621

Table entries are coefficients from mixed-effects logistic regression; standard errors in parentheses; constant included in all models but omitted from presentation; random intercepts for cities (Kisumu, Mombasa, Nairobi) and counties included in all models; $N = 2,416$ in all models; 'no events experienced' is the baseline category left out for comparison.

[†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

due to sudden events, gradual events, or both. Substantively, the impact on our dependent variable is quite noticeable. Respondents' likelihood of participating in peaceful protests is almost 15 percentage points higher than for migrants who have not suffered from environmental events before. Their willingness to participate in rallies that may turn violent and to become an active member of a migrant-interest group is less strongly pronounced, but still visibly present, at five percentage points higher than for non-environmental migrants.

The conclusion about the impact of *Both events* holds when calculating simulated predicted probabilities (King, Tomz & Wittenberg, 2000) of participating in peaceful protest rallies in Figure 3. As the probabilities are therefore simulated parameters, we present density plots that capture their distribution, and the horizontal bars at the bottom of Figure 3 signify the point estimates of the two scenarios' probabilities and their confidence intervals. Clearly, the intervals of the probabilities' point estimates (horizontal bars) do not overlap, which means that the predicted probabilities of the two scenarios (*Both events* being 0 or 1) are statistically significantly different.

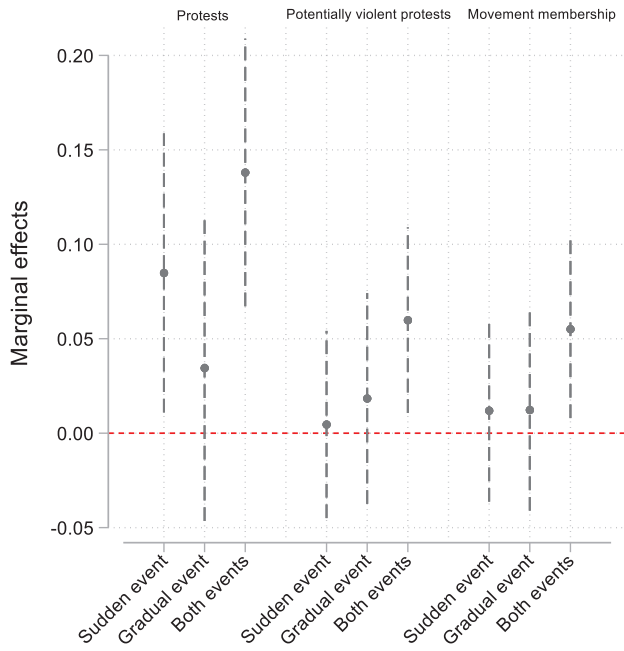


Figure 2. Marginal effects

Graph shows marginal effects at the median, while moving a specific predictor from 0 to 1; dashed lines signify 90% confidence intervals; dotted horizontal line marks marginal effect of 0; ‘no events experienced’ is the baseline category left out for comparison; calculations based on Table VI.

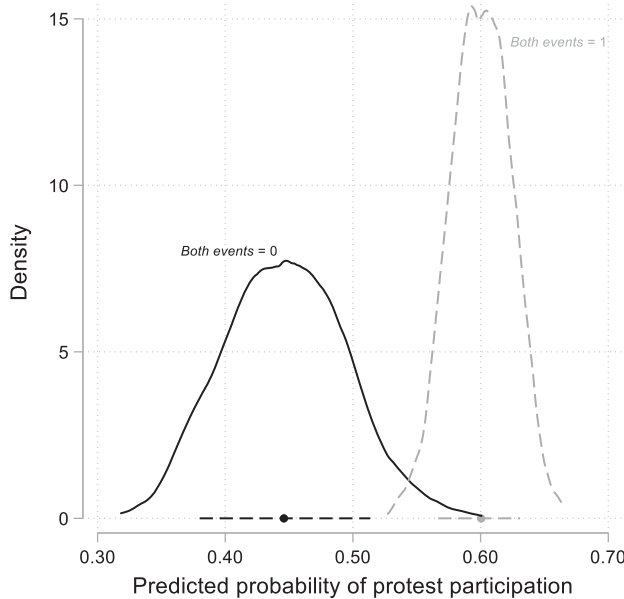


Figure 3. Predicted probabilities of protest participation

Graph shows predicted probabilities and distributions of simulated parameters; horizontal bars pertain to 95% confidence intervals of point estimates; estimates are based on simulations ($N = 1,000$ of simulated parameters), while holding all other variables at their median.

Hence, we are able to identify a statistically significant effect between environmental migrants who have suffered from sudden and gradual events and those who have not. In addition, while the probability of participation centers around 45% when *Both events* is set to 0, the simulated likelihood of migrants who have suffered from both gradual and sudden events to join peaceful protests converges toward about 60%. The experience of certain types of environmental events does therefore indeed drive individuals’ willingness to join and participate in social movements.

Figure 3 focuses on the impact of *Both events* on *Protests*, since the effect estimates are most strongly pronounced for this outcome. As suggested by the regression tables and Figure 2, we still obtain evidence for a significant and substantive influence on *Potentially violent protests* and *Movement membership*, but the associated coefficients are significant at the 10% level only and substantively about ten percentage points weaker than the effect of *Both events* on *Protests*. The other core variables’ effects are not fully consistent across the models in Tables IV to VI. In fact, we mostly obtain insignificant estimates, suggesting that individuals do not differ from our baseline category, that is, migrants who have not experienced any sudden or gradual event before. Having said that, *Sudden event* and *Gradual event* differ in their impact on the outcome variables and whether they can be distinguished from our reference group.

That is, focusing on *Sudden event*, this item reaches conventional levels of significance only for the outcome variable *Protests*, but not for the other dependent variables in any model. This is also demonstrated by the confidence-interval estimates in Figure 2, which overlap with a marginal effect of 0 when having *Potentially violent protests* or *Movement membership* as the outcome. For those estimations in which *Sudden event* is statistically significant, however, the pattern is consistent: if migrants experienced a sudden environmental event in their previous location, they are more willing to participate in peaceful protests in their new city of residence. The substantive quantities of interest displayed in Figure 2 emphasize this, too. Migrants who have suffered from sudden events, in comparison to individuals who have not experienced any environmental event before, are about eight percentage points more likely to be willing to protest in peaceful rallies.

With regard to *Gradual event*, we obtain a different pattern: having experienced environmental long-term events in their previous homes does not make migrants more or less willing to join an interest group or participate in protests (peaceful ones and those that can turn

violent) than individuals who have not suffered from environmental events before. According to Figure 2, the confidence intervals associated with *Gradual event* all overlap with a marginal effect of 0. In sum then, first, migrants who have experienced both gradual and sudden events differ from people whose motivation to migrate was not driven by environmental events in that they are more willing to join protest rallies (peaceful and non-peaceful ones) and become active members of migrant-interest groups. Second, migrants who have experienced sudden events differ from people whose motivation to migrate was not driven by environmental events, but only when it comes to peaceful protests: the former are more likely to be willing to participate; with regards to the other outcome variables, there are no statistically significant differences between *Sudden event* and our baseline category. Third, migrants who have suffered from gradual events only in their former homes are neither more nor less likely than non-environmental migrants to participate in and join social movements.

Linking these findings about our main variables of interest back to the theory and putting the results into a wider context highlights several important conclusions. First, consistent with our theoretical prediction, we find that individuals who have migrated in response to, inter alia, both sudden and gradual environmental events seem more willing to participate in social movements about migrant rights in their 'new homes' than migrants who have suffered from either type of event or from no environmental events. Second, while short-term events significantly and substantively matter for migrants' willingness to join a peaceful protest, long-term, gradual environmental reasons are unlikely to exert a crucial influence on any of our outcome variables. We interpret this pattern as both types of environmental experiences having the potential to affect migrants' willingness to participate in social movements in systematic ways, but this is most strongly given if migrants have experienced both environmental events before – not one of them in isolation from the other. Finally, and this also relates to our control variables, push and pull factors generally matter in influencing individuals' migration choices, but it seems that they are less relevant for shaping migrants' willingness to participate in social movements and their activities. Most control covariates are statistically insignificant across the models, suggesting that they do not play a major role in affecting migrants' intentions to participate in social movements. The estimations on peaceful protests are somewhat an exception as, depending on model specifications, we sometimes obtain evidence that older individuals are less likely to be willing to

protest, but males, those with a low income, and more educated people are apparently more willing to do so.

These findings add crucially to previous studies on the climate change–migration and conflict nexus and this study links back to some influential results of the recent literature. On one hand, Linke et al. (2018) show that climatic events are not associated with universal effects on people's attitudes, including support for violence. Our research finds a similar pattern. On the other hand, a central finding in Koubi et al. (2018) is that migrants who experienced gradual environmental events in their former homes are more likely to perceive conflict in their new location; sudden, short-term environmental events have little, if any, impact. Our work also differentiates between types of events, but has a different scope in that we concentrate on social movements – both peaceful and potentially violent. We find evidence that the influences at work in the more general conflict literature do not hold when examining social movements. This also mirrors, for example, Gleditsch & Rivera (2017).

Conclusion

While it has been argued that climate-change induced weather events trigger population movements that may spill into conflict predominantly in urban centers (e.g. Kelley et al., 2015), scholarly works investigating this claim are rather scarce. This is because systematic research on this relationship faces an inherent dilemma. On one hand, we can study the impact of migration flows, but at the price of being unable to precisely demonstrate whether the environmentally induced part of migration has indeed contributed significantly to political action. On the other hand, scholars can study individual decisions of migration while allowing for the clear identification of climate-induced migration as a distinct motive, but at the expense of being unable to study actual behavior. The aim of this article is to move the latter type of studies more toward being able to draw conclusions on actual behavior about political action. We believe this research fills an important gap, by investigating individuals' stated willingness to join social movements and participate in both peaceful and potentially violent protests.

Our results show that climate-induced migration can indeed result in an increased potential for urban social disorder. In particular, individuals who had experienced both types of climatic events, that is, sudden and gradual, at their initial location are more likely to join and participate in social movements about migrant rights. Furthermore, the findings suggest a substantial difference between

gradual and sudden climate events in inducing urban social disorder. This research, in our reading, strongly emphasizes that climate-induced rural-to-urban migration will not only affect the relationship between urbanization and conflict by increasing the scale, but, more worryingly, by also adding an additional layer of grievances that might qualitatively change this relationship significantly.

Hence, if these urbanization processes are not accompanied by strategies to integrate newcomers and assist them in managing their long-term grievances, a heightened conflict potential might materialize. Another policy option might involve obviating the need for climate-induced migration in the first place by intervening at the earliest stage possible. This implies that sustainable development assistance is required to strengthen the coping capacity of communities affected by climatic changes.

Replication data

The dataset, codebook, and do-files for the empirical analysis in this article, along with the Online appendix, are available at <https://www.prio.org/jpr/datasets/>.



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