ARTICLES
https://doi.org/10.1038/s41558-020-0805-1

nature climate change

Attitudes of urban residents towards environmental migration in Kenya and Vietnam

Gabriele Spilker[1]✉, Quynh Nguyen[2], Vally Koubi[3,4] and Tobias Böhmelt[5]

The displacement of people is an important consequence of climate change, as people may choose or be forced to migrate in response to adverse climate conditions or sudden-onset extreme climate events. Existing studies show that there is a consistently higher social acceptance of migrants fleeing political persecution or war than of economic migrants. Here we examine whether individuals in Vietnam and Kenya also extend the notion of deservingness to environmental migrants in the context of internal rural-to-urban migration, using original data from a choice-based conjoint survey experiment. We find that although residents in receiving areas view short-term climate events and long-term climate conditions as legitimate reasons to migrate, they do not see environmental migrants as more deserving than economic migrants. These findings have implications for how practitioners address population movements due to climatic changes, and how scholars study people's attitudes towards environmental migrants.

Climate change is one of the most important challenges of our time[1]. More frequent and more intense extreme weather phenomena, such as storms and floods, as well as more gradual changes encompassing droughts, desertification and sea-level rise, are expected to have far-reaching repercussions on ecosystems and humans alike. Less developed countries are among the most vulnerable to climate change, since they are often strongly dependent on agriculture for income and food generation, while having limited resources to cope with these environmental changes[1].

In response to changing climatic conditions, individuals and households may employ in situ adaptation strategies to sustain their livelihoods, such as investments in new production technologies (for example, irrigation systems), diversifying income sources or drawing on social networks and public programmes for assistance. Alternatively, individuals may choose to migrate. Migration is a common strategy for survival, income diversification, risk management and adaptation for people facing adverse climatic conditions[2–4].

Evidence suggests that most climate change-induced migration (also referred to as environmental migration and climate migration throughout the article) occurs mostly within countries[2,4]. Between 2008 and 2018, about 265 million people worldwide were displaced internally as a response to disasters[5], and forecasts suggest that climatic changes (particularly drought) may cause as many as 143 million people to be displaced within Latin America, sub-Saharan Africa and South Asia by 2050 (ref. [2]).

Most of these displaced people are projected to relocate to big cities and their outskirts, continuing a long-term global trend of increasing urbanization, especially in Asia and Africa[2,6,7]. Urbanization usually contributes to economic growth[8,9], poverty reduction[10] and inequality reduction[11], and it can enhance local governments' provision of public goods and services[12]. However, if large inflows of migrants are not managed well, urbanization may also lead to substantial economic, social, political and environmental challenges in the form of, for example, more unemployment, poverty, inequality, environmental degradation, and local insecurity and crime. Eventually, the risk of political violence can increase as a result[13,14].

With the intensification of climate change-induced migration within countries, we ask how environmental migrants are perceived among the wider public, especially in urban settings of developing countries (that is, those places most intensively affected by environmental migration). Studies on individuals' attitudes towards international migration show that humanitarian concerns make citizens perceive certain motives of migration (for example, involuntary or forced migration) to be more legitimate than others, and, by extension, they consider certain types of migrants to be more deserving of asylum status than others[15]. Specifically, people are more likely to regard individuals who were forced to migrate (for example, refugees fleeing conflict) as deserving sympathy and help[16,17]. Building on this literature, we argue that individuals in receiving urban areas consider some types of migrants to be more legitimate than others and hence should view environmental migration as a form of involuntary migration that deserves protection. We thus expect city residents to welcome and allow individuals who flee from areas affected by climate change-induced disasters to become residents in their cities. This higher acceptance should be motivated by humanitarian concerns and a higher willingness to help those in need.

Furthermore, we expect urbanites to perceive some types of environmental migrants as even more legitimate than others. The extant literature emphasizes that sudden-onset extreme climate events, such as hurricanes and floods, induce forced (involuntary) migration due to their quick, extreme and often unpredictable occurrence and the vast harm they cause[3,18]. Migrants experiencing such events could be seen as having no alternative other than fleeing, thus being perceived as more in need and ultimately more welcome in cities than migrants who left their homes due to gradual extreme climate events, such as droughts. Due to their long-term nature, the latter usually allow affected individuals to adapt to changing climatic conditions[3,18]. This implies that people experiencing such events have a choice, to some extent, to decide whether and when to migrate. Gradual, long-term climate events therefore tend to result in migration that is probably viewed as voluntary and mainly economically motivated[19]. Urbanites' greater willingness to welcome environmental migrants fleeing sudden, short-term events may also be motivated

[1]University of Salzburg, Salzburg, Austria. [2]Australian National University, Canberra, Australia. [3]ETH Zürich, Zürich, Switzerland. [4]University of Bern, Bern, Switzerland. [5]University of Essex, Colchester, UK. ✉e-mail: gabriele.spilker@sbg.ac.at

by the consideration that this type of environmental migrant is more likely to return to their area of origin than people who suffered long-term environmental deterioration.

Acknowledging the fact that the acceptance of migrants is unlikely to be determined only by the reason for becoming a migrant in the first place, we control in our empirical analysis for factors such as sex, age, socio-economic status and ethnicity, which generally affect public opinion on migration[20] and play an important role in environmental migration[21] and urban conflict[22]. For instance, urbanites are likely to oppose immigration by individuals who put pressure on public goods and the labour market[23–25]. The local population could fear that more people moving into their city, especially low-skilled individuals, will increase the demand for public spending, which imposes an additional fiscal burden[26,27]. There is also anecdotal evidence illustrating this phenomenon with climate-induced migration as a result of the American "Dust Bowl" in the 1930s leading to locals in receiving areas protesting and accusing migrants of taking jobs, lowering wages and crowding relief rolls[28]. Furthermore, ethno-cultural factors may be paramount in urbanites' attitudes towards migrants[21,29,30]. Given that people living in the same area commonly possess certain shared characteristics, such as ethnicity or language, they are likely to perceive migrants belonging to outgroups as a threat to the social status quo as well as to valued cultural beliefs and practices, leading to stronger anti-immigration views[31–33].

This research makes two central contributions to the literature, which extend well beyond the nexus of public opinion and migration. First, existing studies overlook internal environmental migration, although this form of migration is—due to adverse climatic conditions—much more prevalent than, for example, political displacement. For instance, in 2017, 61% of more than 30 million new internal displacements were triggered by weather-related hazards and only 39% by conflict[5]. Second, while existing work provides important insights into the correlates of anti-immigration sentiments, internal (intrastate) migration has rarely been examined (for an exception, see Gaikwad and Nellis[34])—even less so in developing countries, which will face by far the largest share of internal migration. As a consequence, not much is known about individuals' attitudes towards environmental internal migration, and whether public opinion on environmental migrants differs from attitudes towards other migrant types and characteristics.

Migrant acceptance

To examine the determinants of urbanites' attitudes towards internal migrants, we implemented a conjoint experiment, in which respondents from Vietnam (N=1,200) and Kenya (N=1,200) were presented with hypothetical profiles of two potential migrants applying for permanent residence status in the respondent's city. Each migrant profile comprises six attributes (sex, age, level of education, ability to make a living, ethnicity and the reason the applicant migrated; see Table 1) with varying levels. The levels of each attribute as well as the order of attributes were fully randomized. Each respondent compared five pairs of migrants. For each profile, the respondents were asked to rate the migrant on a 1–7 scale, with 1 indicating that the applicant should be sent back to their home location and 7 signifying that the applicant should definitely be granted permanent residence in the city. In a second question, we asked the respondents to select between the two applicants and report whom they preferred receiving permanent residence (see Methods for more details).

Figure 1 shows the overall acceptance levels of migrants across all profiles and respondents. Specific migrant profiles seem to be completely unacceptable for certain citizens in that they score below 4 on the 1–7 scale. However, most profiles have a positive likelihood, ranking at least 4 on the 1–7 scale. In particular, 68% of the profiles for Vietnam and 64% for Kenya were evaluated positively, indicating strong baseline support for internal rural-to-urban migration.

Table 1 | Conjoint matrix of migrant profiles

Attribute	Attribute Levels
(1) Reason for migrating	●→**Victim of storm/flood** ●→**Victim of drought** ●→Religious/ethnic/political persecution ●→Seeking better economic opportunities ●→Family reunification
(2) Ethnicity	●→Kinh/Kalinjin ●→Muong/Kamba ●→Tày/Kikuyu ●→Khmer/Luhya ●→Hmong/Luo
(3) Economic situation	●→Able to sustain himself/herself ●→Likely able to sustain himself/herself ●→Unlikely able to sustain himself/herself ●→Not able to sustain himself/herself
(4) Level of education	●→Not completed primary education ●→Primary school completed ●→Secondary school completed ●→Technical (postsecondary) school completed ●→Tertiary school completed ●→University degree or higher
(5) Age	●→18–25 years old ●→34–48 years old ●→52–65 years old ●→70+ years old
(6) Sex	●→Female ●→Male

The environmental attribute levels are displayed in bold. Attribute levels in italics pertain to the Kenyan sample.

Effects of migrant attributes on migrant acceptance

Figures 2 (Vietnam) and 3 (Kenya) present the average marginal component effects (AMCEs) of specific migrant attributes on the residents' assessments of which migrants should live in their city. The main results are also summarized in Table 2, where models 1 and 2 pertain to Vietnam and models 3 and 4 to Kenya. Models 1 and 3 use the binary choice variable as the dependent variable, while models 2 and 4 use the seven-point rating variable as the dependent variable. All coefficients need to be interpreted relative to the respective baseline category.

While urbanites in Vietnam view family reunification as the most legitimate motive for migration, it is economic migration for Kenyan city residents. In contrast to much of the previous work on attitudes towards international migration, we do not find evidence for a higher acceptance of forced migration. Specifically, in both countries, persecution is seen as the least legitimate reason for rural-to-urban migration. However, the limited impact of persecution on the respondents' willingness to accept migrants must be put into the context of our survey sites. In Vietnam, while there is little information on persecution from official authorities, human-rights organizations (such as Human Rights Watch and Amnesty International) have reported government imprisonment of dissidents and critics of the Communist Party. In addition, independent reporting is not allowed, but most media are government controlled[35]. Thus, given the suppression of information about this issue and the resulting low salience of the phenomenon, it might be the case that resident respondents do not consider persecution as a sufficiently realistic motive (relative to the other motives mentioned in the conjoint) to shape their support for a migrant's application.

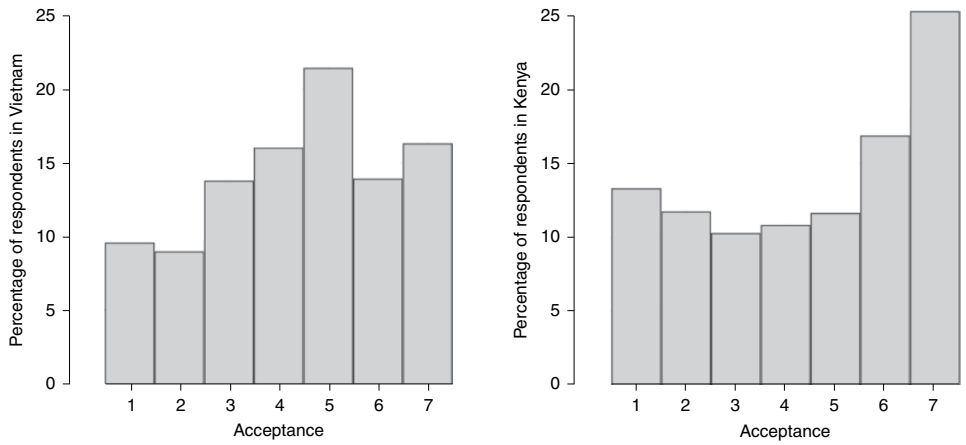

Fig. 1 | Migrant acceptance across profiles. The percentage of respondents that chose each possible answer category from 1 ("migrant should be sent back home") to 7 ("migrant should definitely be granted permanent residency in the city") in the rating task for Vietnam (left) and Kenya (right).

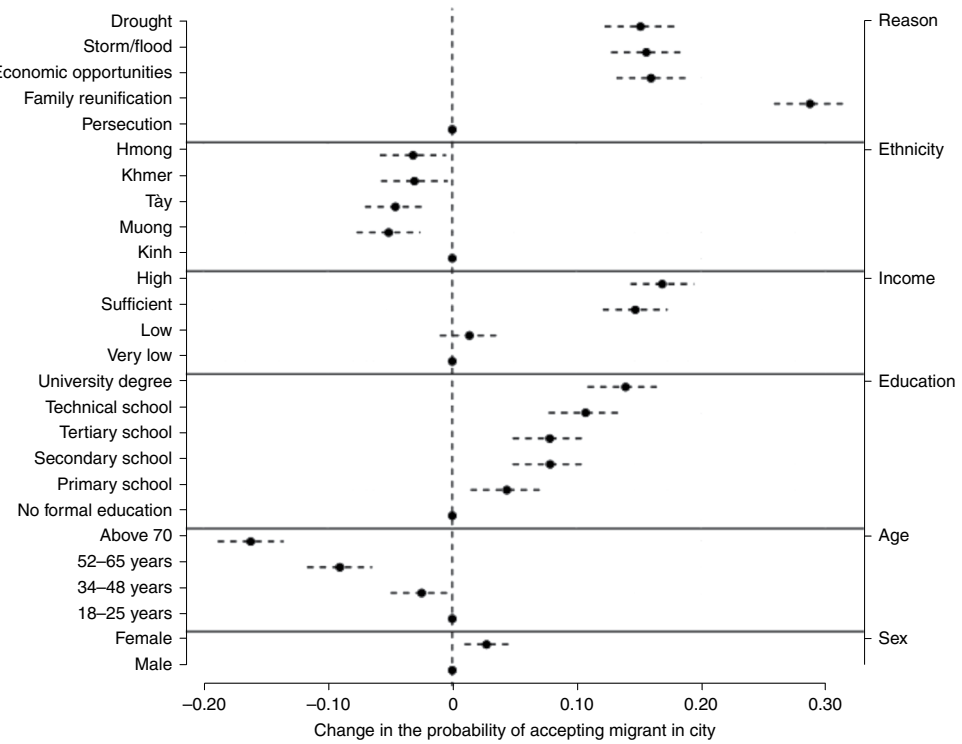

Fig. 2 | Effect of migrant attributes on migrant acceptance in Vietnam. AMCEs (dots) of each attribute level (for example, female) relative to the respective baseline category (for example, male) in the conjoint experiment. The results are based on a model regressing the binary choice variable on different attribute levels. The individual attributes are listed on the left *y* axis, and the attribute clusters are listed on the right *y* axis. A positive effect indicates that the respective attribute level increases the likelihood of migrant acceptance, while a negative effect indicates a reduced acceptance probability. The horizontal dashed lines signify the 95 percent confidence intervals. The standard errors are clustered by respondents. An AMCE of 0 is marked with the vertical dashed line.

Kenya, on the other hand, is considered to be a multiparty democracy, and although its relatively unfettered political rights and civil liberties are often undermined by intimidation and brutality by security forces, especially around election times, Kenyan urban residents still might not consider political persecution as a valid reason. In addition, urban residents may associate people fleeing domestic political persecution with refugees and asylum seekers, whom they consider to be a threat to security and peace (there are about 480,000 registered refugees and asylum seekers in camps as well as urban areas in Kenya, mainly from Somalia and South Sudan). Taken together, these factors might explain why political migrants are the least preferred type of migrants in our survey.

Regarding the legitimacy of environmental/climatic changes as a motive of migration, the results are inconclusive. On one hand, the positive and significant effect indicates that adverse climatic conditions are indeed seen as a legitimate reason to migrate. On the other hand, environmental migrants are not seen as more deserving than economic migrants. In both Vietnam and Kenya, there are no significant differences between the acceptance of climate-induced migration and the acceptance of migration in search of economic

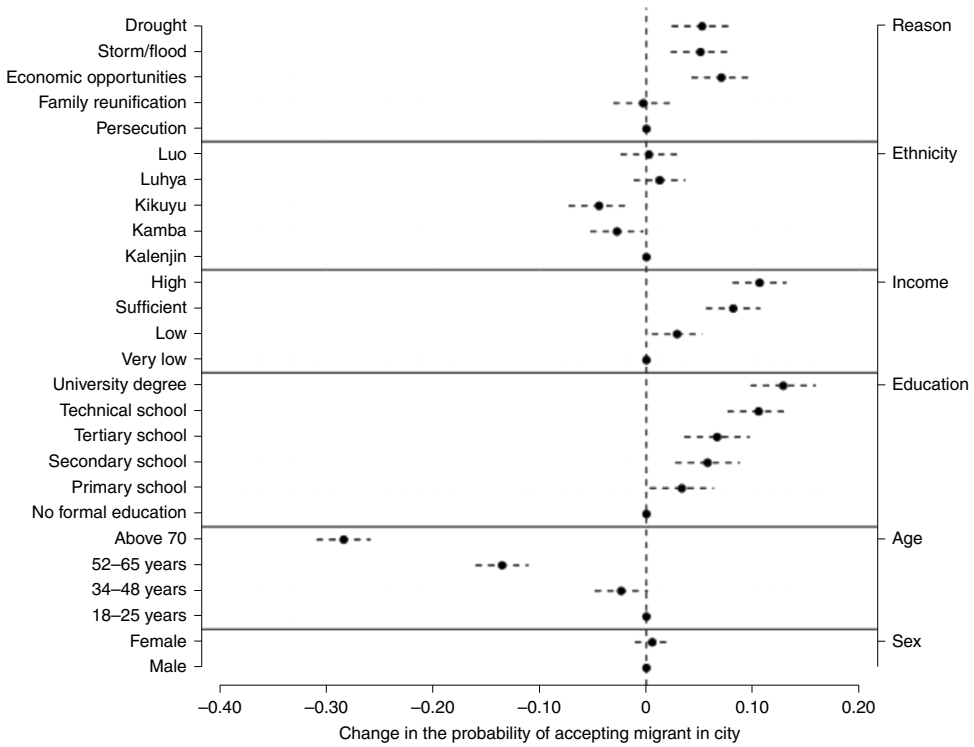

Fig. 3 | Effect of migrant attributes on migrant acceptance in Kenya. AMCEs (dots) of each attribute level (for example, female) relative to the respective baseline category (for example, male) in the conjoint experiment. The results are based on a model regressing the binary choice variable on different attribute levels. The individual attributes are listed on the left *y* axis, and the attribute clusters are listed on the right *y* axis. A positive effect indicates that the respective attribute level increases the likelihood of migrant acceptance, while a negative effect indicates a reduced acceptance probability. The horizontal dashed lines signify the 95 percent confidence intervals. The standard errors are clustered by respondents. An AMCE of 0 is marked with the vertical dashed line.

opportunities. Similarly, city residents do not distinguish between migrants experiencing short-term extreme climate events (such as storms or floods) and individuals who were affected by long-term, gradual events (such as droughts).

These findings run counter to some results in the existent literature, particularly on international migration, where individuals tend to be positively inclined towards those who are not to blame for their plight (for example, refugees escaping war and armed conflict) and are thus more willing to support and assist them[15,16]. In our sample, residents are more willing to grant permanent residence to economic migrants and people moving to urban areas for family reasons (for example, reunification in Vietnam) than to those fleeing persecution. Also, the respondents do not seem to have significantly more sympathy for individuals migrating because of climatic changes than for economy-related movements, although the overall AMCEs for both types of environmental migrant remain positively signed and significant.

The estimated AMCEs for the remaining migrant attributes allow for a clear interpretation. In both countries, migrants who are the least likely to pose a threat to resources and service provision in a city are the most welcome. The respondents have more positive attitudes towards young, well-educated migrants with sufficient monetary resources. In contrast, older migrants and those with low education levels or insufficient income are the least likely to be accepted as permanent residents. Interestingly, our survey respondents do not seem to place much importance on the ethnicities of migrants. While most respondents in Vietnam seem to slightly prefer migrants from the majority ethnic group (Kinh), this effect is relatively small. Similarly, in Kenya, ethnicity plays only a minor role in urbanites' evaluations of migrant profiles.

Subgroup analyses

To understand whether our findings are indeed of a general nature or are driven by group-specific heterogeneity, we conduct a number of subgroup analyses. Certain migrant attributes may matter only in a particular context. For example, Hanoians could be more sympathetic to migrants who suffer sudden-onset climatic events, while residents from Ho Chi Minh City show favourable views towards victims of slow-onset events, because the south of Vietnam suffers more from such environmental hazards. We rely on marginal means (instead of the AMCEs in Figs. 2 and 3) for the evaluation of the subgroups[36]. Supplementary Figs. 1–10 and 11–20 show the marginal means for all respondents as well as the results differentiated by the level of education, income, age and the respondents' climate change beliefs for Vietnam and Kenya, respectively.

We find that the results from the main analysis do not differ substantially across subgroups pertaining to education, age and income. The findings also remain unchanged when comparing the different cities within each country in which the field research took place, although some exceptions do exist (Supplementary Figs. 21–26). For instance, Hanoi residents attach a somewhat more significant role to ethnicity than residents of the other two Vietnamese cities. This is probably due to the fact that the ethnic minorities in the Vietnam conjoint experiment (Hmong, Khmer, Tày and Muong) are located in the northern highlands and thus are geographically close to Hanoi[37]. This proximity may increase the salience of the ethnicity attribute among Hanoians.

To assess in more detail the rather small impact that ethnicity has in our main analysis above, we explore the treatment heterogeneity across the respondents' ethnicities. In particular, we probe whether respondents with different ethnic profiles evaluate the ethnicities of hypothetical migrant profiles differently. Supplementary

Table 2 | Linear regression models for the conjoint experiment

	(1)	(2)	(3)	(4)
	Accept	Like	Accept	Like
	Vietnam	Vietnam	Kenya	Kenya
Female	0.03***	0.09***	0.01	0.00
	(0.009)	(0.033)	(0.008)	(0.036)
34–48 years	−0.02*	−0.11**	−0.02*	−0.10*
	(0.013)	(0.045)	(0.013)	(0.052)
52–65 years	−0.09***	−0.31***	−0.14***	−0.57***
	(0.013)	(0.048)	(0.013)	(0.056)
Above 70	−0.16***	−0.59***	−0.28***	−1.19***
	(0.014)	(0.053)	(0.013)	(0.060)
Primary school	0.04***	0.14**	0.03**	0.22***
	(0.015)	(0.054)	(0.015)	(0.066)
Secondary school	0.08***	0.30***	0.06***	0.39***
	(0.015)	(0.058)	(0.016)	(0.066)
Tertiary school	0.08***	0.39***	0.07***	0.36***
	(0.015)	(0.054)	(0.016)	(0.068)
Technical school	0.11***	0.52***	0.10***	0.47***
	(0.015)	(0.057)	(0.015)	(0.067)
University	0.14***	0.65***	0.13***	0.61***
	(0.016)	(0.060)	(0.016)	(0.071)
Unlikely to sustain himself/herself	0.01	0.04	0.03**	0.09*
	(0.012)	(0.046)	(0.012)	(0.054)
Likely to sustain himself/herself	0.15***	0.74***	0.08***	0.44***
	(0.013)	(0.050)	(0.013)	(0.060)
Able to sustain himself/herself	0.17***	0.90***	0.11***	0.51***
	(0.013)	(0.051)	(0.013)	(0.058)
Muong/Kamba	−0.05***	−0.14***	−0.03**	−0.06
	(0.013)	(0.049)	(0.013)	(0.056)
Tày/Kikuyu	−0.05***	−0.18***	−0.04***	−0.16**
	(0.013)	(0.044)	(0.015)	(0.065)
Khmer/Luhya	−0.03**	−0.11**	0.01	0.05
	(0.014)	(0.050)	(0.012)	(0.055)
Hmong/Luo	−0.03**	−0.17***	0.00	0.00
	(0.014)	(0.050)	(0.014)	(0.060)
Family reunification	0.29***	1.25***	−0.00	0.07
	(0.015)	(0.060)	(0.014)	(0.062)
Storm/flood	0.16***	0.62***	0.05***	0.19***
	(0.014)	(0.059)	(0.014)	(0.063)
Drought	0.15***	0.55***	0.05***	0.17***
	(0.015)	(0.056)	(0.015)	(0.063)
Economic opportunities	0.16***	0.67***	0.07***	0.29***
	(0.014)	(0.058)	(0.014)	(0.064)
Constant	0.27***	3.32***	0.47***	4.22***
	(0.019)	(0.078)	(0.020)	(0.089)
Observations	11,965	11,965	12,290	12,290
R^2	0.08	0.12	0.07	0.07

Robust standard errors clustered on respondents are shown in parentheses. R^2, coefficient of determination. ***$P < 0.01$; **$P < 0.05$; *$P < 0.10$.

Figs. 27–30 indicate that there are few substantial differences in how respondents evaluate the ethnic profiles of potential migrants and that overall ethnicity has a rather small effect compared with other migrant attributes. Supplementary Figs. 31 and 32 complement Figs. 2 and 3 above by providing the results based on the rating variable. All relevant comparisons for the main explanatory variables (that is, the reason for migration) are summarized in Supplementary Tables 1 and 2. Finally, Supplementary Tables 3 and 4 as well as Supplementary Fig. 33 provide additional information on our survey sites.

Conclusions

While cross-border migration and its implications for host countries have captured global attention, there is increasing recognition that climatic changes force far more people to migrate within their own countries than across borders[2,38]. A substantial proportion of these internal migrants eventually move to major cities[2,6]. Such a trend, while it provides opportunities in terms of the agglomeration of population and economies of scale, might also lead to competition for jobs among residents and environmental migrants, put pressure on urban structures for the provision of public goods, and stir existing ethnic or cultural tensions[21]. These developments may increase the risk of political violence[13]. Thus far, however, there was no scientific evidence on whether city residents perceive environmental migrants as a threat to their economic and social well-being or rather show sympathy because of their adverse fate.

Using a choice-based conjoint design, we studied urbanites' attitudes towards environmental migrants in Vietnam and Kenya. Surprisingly, and contrary to the findings in the international migration literature, humanitarian concerns about the deservingness and legitimacy of migration motives do not rank particularly high in urbanites' preferences relating to who should become a resident in their city. This is demonstrated by the fact that compared with persecution, which should rank highest with regard to deservingness, all other potential reasons for migration (except for family reunification in Kenya) actually make it more likely that urbanites have more favourable attitudes towards migration. What is more, even when subscribing to the link between the exposure to climatic changes and deservingness, we do not find significant differences between economic migrants and those moving to urban areas because of environmental reasons. Hence, environmental factors seem to be tied with economic opportunities in terms of where respondents rank them in the context of rural-to-urban migration.

Nevertheless, our findings need to be interpreted in the broader socio-economic context of the survey sites. Both Vietnam and Kenya are low-income countries in which the majority of people move to cities to improve their economic situation for themselves and/or their relatives back in their village of origin. Therefore, in contrast to the negative image of economic migrants portrayed in the public discourse in advanced, industrialized countries, citizens in less developed countries experiencing high urbanization rates have a more positive view of economic migration. The fact that we find economic migration to be perceived as at least as legitimate as environmental migration suggests that citizens in Vietnam and Kenya, possibly due to their more severe exposure to climatic changes, are well aware of the strong interlinkages between economic and environmental conditions.

An additional explanation for the lack of the hypothesized large positive effect of environmental migration on urbanites' willingness to grant permanent residence may be that people are less exposed to environmental than to other types of migrants (family reunification in Vietnam and economic opportunity seeking in Kenya). According to contact theory, people's exposure to a certain phenomenon can have a considerable impact on their opinion[39]. For instance, in Vietnam, residents were significantly less likely to report sympathy towards climate migrants relative to migrants seeking

family reunification. In a separate survey of migrants in Vietnam, which we conducted as part of a larger research project, we find that less than 6% of the surveyed migrants cited an environmental reason for their move to the city, whereas more than 26% reported that they migrated for social reasons (that is, family reunification)[18]. As residents are less exposed to a certain type of migrant, they might be less welcoming of that type than of another group with whom they are more familiar. It could also be argued that the likelihood of residents actually knowing someone in their circle of family and friends who has migrated for the same reason increases with a larger group of migrants. This should, in turn, increase their sympathy towards this type of migrant.

Online content

Any methods, additional references, Nature Research reporting summaries, source data, extended data, supplementary information, acknowledgements, peer review information; details of author contributions and competing interests; and statements of data and code availability are available at https://doi.org/10.1038/s41558-020-0805-1.

Received: 7 November 2019; Accepted: 1 May 2020;
Published online: 22 June 2020

References

1. IPCC *Special Report on Global Warming of 1.5 °C* (eds Masson-Delmotte, V. et al.) (WMO, 2018).
2. Rigaud, K., de Sherbinin, A. & Jones, B. *Groundswell: Preparing for Internal Climate Migration* (World Bank, 2018).
3. McLeman, R. A. *Climate and Human Migration: Past Experiences, Future Challenges* (Cambridge Univ. Press, 2014).
4. *Foresight: Migration and Global Environmental Change—Final Project Report* (Government Office for Science, 2011).
5. *Global Report on Internal Displacement* (Internal Displacement Monitoring Center, 2018).
6. Barrios, S., Bertinelli, L. & Strobl, E. Climatic change and rural–urban migration: the case of sub-Saharan Africa. *J. Urban Econ.* **60**, 357–371 (2006).
7. Brückner, M. Economic growth, size of the agricultural sector, and urbanization in Africa. *J. Urban Econ.* **71**, 26–36 (2012).
8. Brülhart, M. & Sbergami, F. Agglomeration and growth: cross-country evidence. *J. Urban Econ.* **65**, 48–63 (2009).
9. Castells-Quintana, D. & Royuela, V. Agglomeration, inequality and economic growth. *Ann. Regional Sci.* **52**, 343–366 (2014).
10. Sekkat, K. Urban concentration and poverty in developing countries. *Growth Change* **48**, 435–458 (2017).
11. Oyvat, C. Agrarian structures, urbanization, and inequality. *World Dev.* **83**, 207–230 (2016).
12. Turok, I. & McGranahan, G. Urbanization and economic growth: the arguments and evidence for Africa and Asia. *Environ. Urban.* **25**, 465–482 (2013).
13. Bloom, D. E., Canning, D. & Fink, G. Urbanization and the wealth of nations. *Science* **319**, 772–775 (2008).
14. Koubi, V. Climate change and conflict. *Annu. Rev. Polit. Sci.* **22**, 343–360 (2019).
15. Verkuyten, M., Mepham, K. & Kros, M. Public attitudes towards support for migrants: the importance of perceived voluntary and involuntary migration. *Ethn. Racial Stud.* **41**, 901–918 (2018).
16. Bansak, K., Hainmueller, J. & Hangartner, D. How economic, humanitarian, and religious concerns shape European attitudes toward asylum seekers. *Science* **354**, 217–222 (2016).
17. Weiner, B. *Judgments of Responsibility: A Foundation for a Theory of Social Conduct* (Guilford, 1995).
18. Koubi, V., Spilker, G., Schaffer, L. & Böhmelt, T. The role of environmental perceptions in migration decision-making: evidence from both migrants and non-migrants in five developing countries. *Popul. Environ.* **38**, 134–163 (2016).
19. Cattaneo, C. et al. Human migration in the era of climate change. *Rev. Environ. Econ. Policy* **13**, 189–206 (2019).
20. Hainmueller, J. & Hopkins, D. J. The hidden American immigration consensus: a conjoint analysis of attitudes toward immigrants. *Am. J. Polit. Sci.* **59**, 529–548 (2015).
21. Reuveny, R. Climate change-induced migration and violent conflict. *Polit. Geogr.* **26**, 656–673 (2007).
22. Østby, G. Rural–urban migration, inequality and urban social disorder: evidence from African and Asian cities. *Confl. Manage. Peace Sci.* **33**, 491–515 (2016).
23. Dancygier, R. M. & Donnelly, M. J. Sectoral economies, economic contexts, and attitudes toward immigration. *J. Polit.* **75**, 17–35 (2013).
24. Hainmueller, J. & Hopkins, D. J. Public attitudes toward immigration. *Annu. Rev. Polit. Sci.* **17**, 225–249 (2014).
25. Malhotra, N., Margalit, Y. & Mo, C. H. Economic explanations for opposition to immigration: distinguishing between prevalence and conditional impact. *Am. J. Polit. Sci.* **57**, 391–410 (2013).
26. Facchini, G. & Mayda, A. M. Does the welfare state affect individual attitudes toward immigrants? Evidence across countries. *Rev. Econ. Stat.* **91**, 295–314 (2009).
27. Kahl, C. H. *States, Scarcity, and Civil Strife in the Developing World* (Princeton Univ. Press, 2008).
28. Boustan, L. P., Fishback, P. V. & Kantor, S. The effect of internal migration on local labor markets: American cities during the Great Depression. *J. Labor Econ.* **28**, 719–746 (2010).
29. Hainmueller, J. & Hangartner, D. Who gets a Swiss passport? A natural experiment in immigrant discrimination. *Am. Polit. Sci. Rev.* **107**, 159–187 (2013).
30. Hopkins, D. J. The upside of accents: language, inter-group difference, and attitudes toward immigration. *Br. J. Polit. Sci.* **45**, 531–557 (2015).
31. Beall, J., Guha-Khasnobis, B. & Kanbur, R. In *Urbanization and Development: Multidisciplinary Perspectives* (eds Beall, J. et al.) 3–16 (Oxford Univ. Press, 2020).
32. Card, D., Dustmann, C. & Preston, I. Immigration, wages, and compositional amenities. *J. Eur. Econ. Assoc.* **10**, 78–119 (2012).
33. Raleigh, C., Jordan, L. & Salehyan, I. *Assessing the Impact of Climate Change on Migration and Conflict* (World Bank, 2008).
34. Gaikwad, N. & Nellis, G. The majority–minority divide in attitudes toward internal migration: evidence from Mumbai. *Am. J. Polit. Sci.* **61**, 456–472 (2017).
35. *World Report 2019: Vietnam: Events of 2018* (Human Rights Watch, 2019).
36. Leeper, T. J., Hobolt, S. B. & Tilley, J. Measuring subgroup preferences in conjoint experiments. *Polit. Anal.* **28**, 207–221 (2019).
37. *Ethnic Minority Groups in Vietnam* (United Nations Population Fund, 2011).
38. Hunter, L. M., Luna, J. K. & Norton, R. M. Environmental dimensions of migration. *Annu. Rev. Sociol.* **41**, 377–397 (2015).
39. Allport, G. *The Nature of Prejudice* (Perseus Books, 1954).

Methods

Sampling. In both countries, the experiment was conducted in two major cities (Hanoi and Ho Chi Minh City in Vietnam; Nairobi and Mombasa in Kenya) as well as in one smaller city located close to one of the two major urban centres (Thu Dau Mot in Vietnam; Kisumu in Kenya) (Supplementary Fig. 33). The inclusion of the two smaller cities allows us to evaluate whether attitudes towards internal migrants depend on city size. The fieldwork was conducted in July–October 2018 for Vietnam and in January–March 2019 for Kenya. In each city, we surveyed 400 residents, resulting in a total sample of 1,200 respondents per country. Due to the lack of appropriate household lists, we employed a multistage convenience sampling strategy to recruit participants.

A respondent is defined as a city resident in our survey if they met the following four criteria: (1) are 16 to 65 years of age, (2) have permanent residence in the city of survey, (3) have lived in the survey site for five years or more and (4) have never relocated to another location for more than six months within the past five years.

Our additional criteria (1, 3 and 4) for city residence status do not match with the definition of the official authorities, which requires only having permanent residence status (for example, individuals who have permanent residence status in the city under survey, but have moved to another location for longer than six months in the past five years would still qualify as city residents according to the official authorities). We therefore could not rely on the existing household lists. Instead, we employed a multistage convenience sampling strategy to recruit participants. The sampling procedure consisted of four steps. First, in each city, we randomly selected three or four districts (Vietnam) or constituencies (Kenya) in the two largest cities and in a smaller one (in Hanoi, Dong Anh District, Me Linh District, Nam Tu Liem District and Gia Lam District; in Binh Duong, Thu Dau Mot City, Ben Cat Town, Di An Town and Thuan An Town; in Ho Chi Minh City, Binh Chanh District–Tan Phu District, Thu Duc District and Go Vap District; in Nairobi, Dagoretti North, Embakasi, Kasarani and Ruaraka; in Mombasa, Jomvu, Kisauni, Likoni and Mvita; in Kisumu, Kisumu Central, Kisumu East and Kisumu West). Second, within each district, ten enumeration sites were randomly selected. The map in Supplementary Fig. 33 shows the locations of our survey sites and provides information about the population sizes of the selected cities. Third, in each enumeration site, we identified a starting point from where enumerators would begin the selection of households. The starting points are typically located at a central location in the district, such as the central market, a hospital or the local community building. Finally, for the selection of households, from the starting point, interviewers adopted the right-hand rule, skipping every second house. Furthermore, we tried to enforce gender and age quotas to have broadly equal numbers of respondents from each group.

To examine the representativeness of our samples, we compared the distributions of key demographic variables (that is, age, sex, ethnicity, income and education) in our sample with the distributions in surveys conducted by national statistics agencies in the two countries for the city populations under study. Whenever data from national agencies were unavailable, we used information from nationally representative surveys conducted by other agencies or international institutions (for example, the United Nations). As shown in Supplementary Table 3, despite the lack of household lists to use as sampling frames to randomly select respondents, the samples are, in fact, quite comparable across all variables. The only exceptions are age and education in the Binh Duong sample. The respondents in our survey were considerably older and more educated. We thus examined the heterogeneous treatment effects across age and education groups, but we find no statistically significant differences in responses between these groups (Supplementary Tables 1 and 2).

Vietnamese and Kenyan contexts. Environmental issues are highly salient among the Vietnamese public. According to a large, nationally representative survey by the United Nations Development Programme ($N > 14{,}000$ respondents) conducted in 2018, 78% of the people surveyed reported that the global climate is changing[40]. There is also some anecdotal evidence from a recent environmental disaster that began in April 2016. In response to the Formosa scandal, an unprecedented number of people from various backgrounds protested despite the eminent risk of arrest and violence[41]. Similarly, according to the most recent Afrobarometer (Round 7), conducted with 1,600 adult Kenyans in 2016, 65% of the participants had heard of climate change, though awareness was more limited among less-educated citizens (41% of those with no formal education compared with 83% of those with postsecondary qualifications), poor citizens (55% of those with high lived poverty compared with 74% of those with no lived poverty), rural residents (62% of rural residents compared with 70% of urban residents) and residents of the North Eastern area (45% compared with 73% of those in the Nairobi area). There is little difference across sexes (men, 68%; women, 62%) or age cohorts (65% for 18–55 years old and 62% for 56+ years). Furthermore, among those who have heard about climate change, 59% identified climate change as referring to negative changes in the weather, and more than 90% said that climate change was affecting their country and their own lives at least "a little bit". Half (50%) said that it was affecting Kenya "a lot". Finally, about half (51%) of Kenyans said that climate conditions for agricultural production have gotten worse over the past decade[42,43]. This view was most common in the drought- and flood-prone North Eastern area (79%). It is worth noting that Kenya has been grappling with a persistent drought and related food insecurity since 2014 (ref. [44]).

Survey implementation. In Vietnam, we contracted the Mekong Development Research Institute (http://mdri.org.vn/) for the implementation of the fieldwork. In Kenya, we commissioned Digital Divide Data Kenya Limited (https://www.digitaldividedata.com/). The surveys were conducted face-to-face using tablets. As the work of the enumerators contributes substantially to the quality of the data collection, we took considerable care in the recruitment and training of the enumerators. The recruitment process comprised three rounds: (1) application screening, (2) a written test assessment during the training course and (3) an evaluation of the applicants' interview performance through their participation in the training course. The key selection criteria were the interviewers' experience in conducting surveys with respondents from diverse backgrounds, their familiarity with the selected survey sites and their knowledge of computer-assisted interviews in the field. The enumerator training took place in two cities in Vietnam (Hanoi and Ho Chi Minh City) and one city in Kenya (Nairobi). Over the course of several days (two-and-a-half days in Vietnam and four days in Kenya), the enumerator candidates were guided through the questionnaires and practiced using the tablets. Furthermore, they were required to conduct mock interview exercises in class and a real pilot interview in the field. The training course was designed to equip interviewers with both the technical knowledge and the soft skills needed for the fieldwork implementation. In particular, the training provided an understanding of the idea and implication underlying each question, emphasized the interviewing skills, and prepared the interviewers with essential skills to handle situations that may occur during fieldwork. The training primarily comprised lectures, discussion rounds, practice and an actual field interview delivered by experienced trainers from the contracted institutes and a member of the research team. Given our concerted efforts to recruit highly qualified enumerators and the rigorous interviewer training, we reported satisfactory response rates across all enumeration sites (Supplementary Table 4).

All enumerators selected for the fieldwork are from the ethnic majority group (Kinh/Kikuyu). However, all enumerators are familiar with the assigned survey sites and familiar with special local customs in the interactions with their interview partners. We also ensured that we had equal numbers of female and male enumerators. While some interviewer bias may still have occurred, we are confident that the careful measures we undertook in the recruitment and training of the enumerators minimizes the potential interviewer effects.

In addition to carefully selecting and training the interviewers for our survey, we included another aspect to lower the potential bias that interviewers can have on survey outcomes—namely, the specific design of the conjoint experiments. By randomizing both the values that appear for each attribute and the order in which the different attributes are presented, combined with the fact that ethnicity is only one of six attributes, we minimize the risk that individuals reacted to only one very specific attribute (for example, the specific ethnicity of the migrant in question). Hence, in this sense, conjoint experiments are a very useful tool to circumvent such potential problems of social desirability[24].

Model specification. To examine the determinants of urbanites' attitudes towards intrastate migrants, we implemented a conjoint experiment. Choice-based conjoint analysis is a technique for handling situations in which a respondent has a choice between options that vary simultaneously across two or more attributes. Given a set of assumptions outlined below, it allows for a causal estimation of the AMCE (ref. [45]).

In a typical choice-based conjoint analysis, each respondent i ($i \in [1, \ldots, N]$) sees several choice tasks (K). In our experiment, the respondents were asked to choose between $J = 2$ alternative migrant profiles in each of their $K = 5$ choice tasks. Each of the profiles has a given number of attributes (L) that can take on different values (D). In our case, the experiment consisted of $L = 6$ attributes (reason for migration, ethnicity, income, education, age and sex; see Table 1). Sex was the attribute with the lowest number of levels ($D = 2$; female and male) whereas education was the attribute with the highest number of levels ($D = 6$; no formal education, primary school, secondary school, tertiary school, technical school and university degree).

The levels of each attribute as well as the order in which attributes appeared were fully randomized. In particular, we randomized the order in which the attributes appear in the conjoint task (which one is listed first, second and so on) and which attribute level appears in the respective task (for example, high, sufficient, low or very low income). This complete randomization allows the estimation of the AMCE using a linear regression estimator given the following assumptions, as shown by Hainmueller et al.[45]: stability and no carry-over effect, no profile-order effect, randomization of profiles, and completely independent randomization.

Furthermore, by asking the respondents to evaluate different profiles of potential migrants consisting of several relevant characteristics (for example, the migrants' age or sex), a conjoint experimental design not only takes into consideration that the acceptance of migrants is a multidimensional choice but also circumvents potential bias due to social desirability. This is a common and very

relevant problem in migration studies; thus, a conjoint design is often considered to be the most appropriate choice[20,46–50].

When comparing hypothetical migrant profiles, the respondents were asked to first rate each migrant on a 1–7 scale, where 1 indicates that "the applicant must be sent back to their home location by all means" and 7 indicates that "the applicant should definitely be granted permanent residence in the city". Second, we asked the respondents to select between the two applicants and report which one they would prefer to receive permanent residence status. We therefore have two potential dependent variables: a binary choice variable (which potential migrant was chosen) and a rating variable for each profile.

We worded our rating question in this particular way due to the following reason. In the three Vietnamese cities of our study, 72% of the urban migrants in Binh Duong, 36% in Ho Chi Minh City and 18% in Hanoi lack permanent registration status[51]. When it comes to public opinion about the *ho khau* system, the World Bank finds that there is still substantial support for elements of the system. In particular, Vietnamese citizens express support for the necessity to ensure public safety and limit migration[51].

While the Vietnamese *ho khau* system is not directly applicable in present-day Kenya, restrictive settlement policies on migration to cities like Nairobi and Mombasa were in place during the colonial era. For instance, in 1945–1961, most migrants to urban areas were largely unskilled workers who migrated to Nairobi and were allowed to remain there only for prescribed periods of time[52]. This so-called pass system, which required migrants to obtain a permit to reside in major urban areas, among other migration rules, was relaxed after Kenya's independence in 1963. However, given that cities in Kenya for most part have grown in a manner that has promoted segregation, including along ethnic lines, we believe that the suggested scenario of granting residence in the city is suitable and reasonable, and can generate insights with broader relevance to contemporary urbanizing societies.

Estimation. Following Hainmueller et al.[45], we estimate the AMCEs by using a linear regression with the binary choice variable as the dependent variable and the different values of the attributes (for example, whether the potential migrant is male or female) as the independent variables. Each of the attribute levels is measured in binary form, and we include $D-1$ attribute levels in our regression. The standard errors are clustered on the respondents to account for the non-independence of their (2×5) choices. The results are, however, identical if we use the ranking variable, ranging from 1–7, as the dependent variable instead (Supplementary Figs. 31 and 32).

For the various subgroup analyses, which we present in Supplementary Figs. 1–30, we follow Leeper et al.[36] and rely on marginal means instead of AMCEs. Marginal means are the column and row mean outcomes for each attribute level, averaging across all other attributes. The reason we use marginal means instead of AMCEs for the subgroup analysis is that the AMCE, as shown in Table 2, is relative to the baseline category that is left out for estimation. While this does not matter for the estimation of sample AMCEs, it can matter for the subgroup analyses if the relevant subgroups differ in their evaluations of the attribute level used as the baseline. To illustrate this point, if highly educated urbanites differed from urbanites with low levels of education in how they perceived female migrants, the subgroup estimation of the AMCE of sex is biased, as it is relative to this baseline evaluation. Marginal means circumvent this problem since they show the probability that a respective profile is chosen, given that this attribute level is present.

To illustrate the interpretation of the marginal means, we use the example of religious/ethnic/political persecution as the reason for migration. The marginal mean for this attribute level is about 0.35 for Vietnam (Supplementary Fig. 1) and about 0.45 for Kenya (Supplementary Fig. 11). This implies that in the case of Vietnam, only about 35% of migrant profiles are chosen if religious/ethnic/political persecution equals 1. In the case of Kenya, it is 45%; thus, half of the profiles are accepted if religious/ethnic/political persecution equals 1, while the other half are not.

As described above, following Hainmueller et al.[45], we randomize all aspects of the conjoint, which results in a uniform distribution of profiles. This implies that our distribution might not correspond to the real internal migrant profile distributions in Vietnam and Kenya[53]. Most internal migration in developing countries is poorly recorded; hence, there exist very limited data sources from which to obtain the relevant distributions. Census records provide the overall number of migrant flows (although this number might also be inaccurate), but they lack information on many of the characteristics of migrant populations. In Vietnam, the 2015 National Internal Migration Survey (conducted by the General Statistics Office with technical and financial assistance by the United Nations Population Fund to interview almost 5,000 migrants from 20 provinces) presents a very useful source of information on important characteristics of the migrant population in the country. For example, findings from this survey suggest that migrants tend to be younger than non-migrants and that the percentage of migrants who have education at the college/university level or higher is larger than the share of non-migrants with a college/university education. The survey report notes that these "differences are partly due to the impact of the younger age structure of the migrant population compared with the non-migrant population. In fact, many young people migrate to access higher educational institutions which are overwhelmingly located in urban areas"[54]. However, the main problem is that the definition of a migrant used in that survey differs from the definition of a migrant in our survey. In the National Internal Migration Survey[54], migrants are defined as individuals who have moved from one district to another district in the five years prior to the survey (in addition to some other criteria). This means that migrants can be individuals who have moved from another district in the city. However, migrants as we describe them to the respondents in our conjoint experiment must have explicitly moved from a rural area to the city where the respondent resides. We therefore lack the relevant information for the types of migrants described in our study. In Kenya, to the best of our knowledge, no comparable information exists about the migrant population in the country. Thus, given the very limited information about internal migrants in the two countries, we are not able to provide a clear estimate of how well the hypothetical profiles fit the actual profiles. We provide the descriptive statistics for our respondents differentiated by each survey site and how well their distributions compare to the actual populations at these sites in Supplementary Table 1.

Ethics statement. According to the Federal Act on Research involving Human Beings (Human Research Act) of 30 September 2011 by the Federal Assembly of the Swiss Confederation, on the basis of Article 118b, paragraph 1, of the Federal Constitution (https://www.admin.ch/opc/en/classified-compilation/20061313/index.html), and under consideration of the Dispatch of the Federal Council dated 21 October 2009, this research was granted a waiver of ethical approval from the Ethics Commission of ETH Zürich. Informed consent was obtained from all respondents prior to their participation in the survey.

Reporting Summary. Further information on research design is available in the Nature Research Reporting Summary linked to this article.

Data availability

The data and replication materials are available from the corresponding author and on the Harvard Dataverse Network (https://dataverse.harvard.edu/dataverse/urban_attitudes_on_environmental_migrants). Source Data for Figs. 1–3 are provided with the paper.

References

40. *The 2018 Viet Nam Governance and Public Administration Performance Index (PAPI): Measuring Citizens' Experiences* (Centre for Community Support and Development Studies (CECODES), Centre for Research and Training of the Viet Nam Fatherland Front (VFF-CRT), Real-Time Analytics, and United Nations Development Programme (UNDP), 2019).
41. Paddock, R. Toxic fish in Vietnam idle a local industry and challenge the state. *The New York Times* (9 June 2016); https://www.nytimes.com/2016/06/09/world/asia/vietnam-fish-kill.html
42. Macharia, W., Isbell, T. & Kopf, A. *Kenyans Say Climate Change Affecting Personal Lives and Country* (Afrobarometer, 2018); https://afrobarometer.org/publications/ad183-kenyans-say-climate-change-affecting-personal-lives-and-country
43. Selormey, E., Dome, M. Z., Osse, L. & Logan, C. *Change Ahead: Experience and Awareness of Climate Change in Africa* (Afrobarometer, 2019); https://afrobarometer.org/publications/pp60-change-ahead-experience-and-awareness-climate-change-africa
44. *Kenya: Drought—2014–2020* (ReliefWeb, 2019).
45. Hainmueller, J., Hopkins, D. J. & Yamamoto, T. Causal inference in conjoint analysis: understanding multidimensional choices via stated preference experiments. *Polit. Anal.* **22**, 1–30 (2014).
46. Berinsky, A. J., Rizzo, T., Rosenzweig, L. R. & Heaps, E. Attribute affinity: US natives' attitudes toward immigrants. *Polit. Behav.* https://doi.org/10.1007/s11109-018-9518-9 (2018).
47. Clayton, K., Ferwerda, J. & Horiuchi, Y. Exposure to immigration and admission preferences: evidence from France. *Polit. Behav.* https://doi.org/10.1007/s11109-019-09550-z (2019).
48. Hartman, A. C. & Morse, B. S. Violence, empathy and altruism: evidence from the Ivorian refugee crisis in Liberia. *Br. J. Polit. Sci.* **50**, 731–755 (2018).
49. Malhotra, N. & Newman, B. Explaining immigration preferences: disentangling skill and prevalence. *Res. Polit.* **4**, 2053168017734076 (2017).
50. Ward, D. G. Public attitudes toward young immigrant men. *Am. Polit. Sci. Rev.* **113**, 264–269 (2019).
51. Demombynes, G. & Vu, L. H. *Vietnam's Household Registration System (English)* (World Bank Group, 2016).
52. Cummings, R. J. *Migration and National Development: The Kenyan Example* (African Migration and National Development, 1985).
53. De la Cuesta, B., Egami, N., Imai, K. & Harvard, S. P. *Improving the External Validity of Conjoint Analysis: The Essential Role of Profile Distribution* (2019).
54. *The 2015 National Internal Migration Survey: Major Findings* (General Statistics Office (GSO), United Nations Population Fund (UNFPA), 2016).

Acknowledgements
This research was partly funded by the Swiss Network for International Studies. T.B. acknowledges support from the British Academy (grant no. SRG19\190780, in partnership with the UK Department for Business, Energy, and Industrial Strategy).

Author contributions
G.S. contributed to the manuscript preparation, data collection, graph generation, model estimation and model interpretation. Q.N. contributed to the manuscript preparation, data collection, and conjoint development and application. V.K. contributed to the project formulation, data collection, manuscript preparation and conjoint application. T.B. contributed to the manuscript preparation, graph generation and model interpretation.

Competing interests
The authors declare no competing interests.

Additional information
Supplementary information is available for this paper at https://doi.org/10.1038/s41558-020-0805-1.

Correspondence and requests for materials should be addressed to G.S.

Peer review information *Nature Climate Change* thanks Nikhar Gaikwad and the other, anonymous, reviewer(s) for their contribution to the peer review of this work.

Reprints and permissions information is available at www.nature.com/reprints.

nature research

Corresponding author(s): Spilker, Gabriele

Last updated by author(s): Apr 9, 2020

Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Research policies, see Authors & Referees and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed
☒	☐ The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒ The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☐	☒ A description of all covariates tested
☐	☒ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒ For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☐	☒ Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	Data collection is described in Methods section of the paper
Data analysis	All replication data and code can be found here: https://dataverse.harvard.edu/dataverse/urban_attitudes_on_environmental_migrants

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors/reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Research guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A list of figures that have associated raw data
- A description of any restrictions on data availability

Provide your data availability statement here.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	Survey experiment of urbanites attitudes towards environmental migrants
Research sample	Residents of three cities in Vietnam (N=1,200) and of three cities in Kenya (N=1,200)
Sampling strategy	We employed a multi-stage convenience sampling strategy to recruit participants. Details are described in the Methods section.
Data collection	In both countries we contracted a survey company to do face-fo-face interviews. Details are described in the Methods section.
Timing	The field work was conducted in July-October 2018 for Vietnam and in January-March 2019 for Kenya
Data exclusions	no data was excluded
Non-participation	Response rates were: Ho Chi Minh City 74% Nairobi 75%, Binh Duong 85% , Kisumu 93%, Hanoi 77%, Mombasa 83%
Randomization	The surveys were conducted on computer tablets, which allows for randomly generated conjoint profiles for each respondent using a specific software based on a random generator approach. We applied uniform randomization without any restriction, i.e., each attribute level has an equal probability of being drawn and every possible level combination has the possibility of being shown to a respondent.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology
☒	☐ Animals and other organisms
☒	☐ Human research participants
☒	☐ Clinical data

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging